THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. VIII. Nº 167—11th YEAR.] LONDON, MARCH 15, 1859. [Subscription per Ann. {15s. in Advance 18s Credit.] Price 8d. Unstamped.

TO GAS COMPANIES.

FIRE-CLAY Retorts and Fire Goods.

The Advertiser has brought his Fire-Clay Retorts to great perfection, both as to quality and finish. Many have stood three and four years.

Every description of Fire Goods in any quantity always on hand. The Fire Clay is the very best in the North of England. Stock never less than 10,000 tons weathering.

Orders promptly executed.

Apply, G. H. RAMSAY, of Derwenthaugh Fire-Brick Works, near NEWCASTLE-ON-TYNE.
Aug. 22, 1856.

MANAGER OF GAS-WORKS WANTED.

IN consequence of the intended retirement of Mr. LYON, who has for upwards of 28 years been Manager of the EDINBURGH AND LEITH GASLIGHT COMPANY, the Directors have resolved to appoint a SUCCESSOR to that Gentleman.

He must be a thoroughly educated practical Engineer, intimately acquainted with the construction of the most approved Machinery for the Manufacture and Distribution of Gas, to plan and superintend the execution of all the requisite Machinery and Apparatus, and to take the entire management of the Company's Works. Salary to commence at £350 per annum.

Printed applications and Testimonials to be forwarded to the Subscriber on or before the 9th of April, and the party to be appointed must enter on his duties by the end of July both next.

By order of the Directors,
FRAS. LYON.
Edinburgh and Leith Gaslight Company,
8, George Street, Feb. 21, 1859.

WANTED, by the Keighley Local BOARD OF HEALTH, a small HIGH-PRESSURE ENGINE, from 2 to 4 horse power.

Apply to RISHWORTH ASQUITH, Gas Office, Keighley YORKSHIRE.
Feb. 24, 1859.

COWEN'S PATENT FIRE-CLAY RETORTS.

JOSEPH COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE CLAY."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their Works as above.

COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.

FIRST PRIZE IN THE PARIS EXHIBITION.

JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY;
ALMA WORKS,
WALSALL, STAFFORDSHIRE;
and 69, UPPER THAMES STREET, LONDON,

Original Manufacturers of Wrought-Iron Gas Tubes, and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.

J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.

Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.

N.B. All Goods thoroughly Tested before sent out, and Warranted.

BLAYDON BURN AND LOW BENWELL FIRE-CLAY RETORT AND FIRE-BRICK WORKS, NEAR NEWCASTLE-ON-TYNE.

WILLIAM COCHRAN CARR begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.

London Agents:
JAMES LAWRIE & CO.,
63, OLD BROAD STREET, CITY, LONDON.

TO IRONFOUNDERS AND OTHERS

WANTED, by the Yeovil Gas and COKE COMPANY,

600 yards of ×-inch SOCKET GAS-PIPES,
300 yards of 4-inch do. do.
260 yards of 3-inch do. do.

To be delivered at one of the Yeovil Railway Stations.

Tenders, stating price and weight per yard, likewise the price per cwt. of Syphons, Tees, and Bends, to be sent to Mr. JOHN BUNN, Manager, Gas-Works, YEOVIL, on or before the 28th day of March instant.

The Pipes to be supplied within a month after the acceptance of the Tender.
Yeovil, March 10, 1859.

TO FOREMEN OF GAS-WORKS AND OTHERS.

THE Directors of a Gas Company in a small town in the West of England are desirous of entering into a CONTRACT, from the 1st of July next, for the SUPPLY OF GAS at so much per 1000 feet.

The private consumption is abont 800,000 feet per annum, and there are 23 public lamps.

All necessary information may be obtained from the SECRETARY to the Gas Company, Thornbury, GLOUCESTERSHIRE.

WILLIAM SUGG'S

GOVERNOR FOR PUBLIC LIGHTS.

For the purpose of Maintaining an Uniform Rate of Consumption, under varying Pressures, in Street Lamps, during all the Hours of Burning.

SKETCH OF PUBLIC LAMP, WITH GOVERNOR ATTACHED.

These Governors, which have been tried and much approved of by the most eminent Gas Engineers of the day, may be relied upon as effectually securing those important results in Public Lighting, steadiness of flame and increased brilliancy of light, combined with uniformity of consumption.

They are constructed of first-rate durable materials, carefully adjusted, and tested at a very high pressure to ensure soundness, and will therefore work with unfailing accuracy; at the same time their simplicity is a guarantee for their remaining in order without any attention.

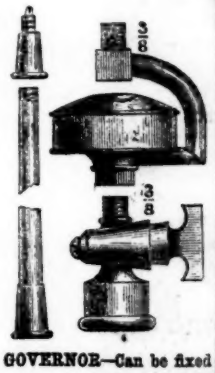
PRICE, ADJUSTED READY FOR FIXING, 36s. PER DOZEN NET.

LAVA BURNERS for the Public Lights to burn their quantity at 8/10ths pressure—2½, 3½, 4, or 5 feet per hour, cased in brass to prevent breakage, for common or cannel gas, 24s. per gross net.

LAVA PHOTOMETER BURNERS, sun-rings, to burn 5 feet per hour, 3 chimney, 5s. 6d. net. LAVA DITTO, drilled rings, 15 hole, parliamentary 7 chimney, 4s. net.

ALL OTHER KINDS OF LAVA BURNERS.

These Burners are quite incorrodible and indestructible by heat, therefore are particularly suitable for Public Lighting, and, being very carefully cut, each size will be found uniform.



GOVERNOR—Can be fixed inside Lantern, or underneath, as shown opposite.

WILLIAM SUGG,

GAS ENGINEER, AND MANUFACTURER OF GAS-METERS AND GOVERNORS FOR GAS-WORKS AND CONSUMERS,

19 and 20, MARSHAM STREET, WESTMINSTER.

CIRCULARS OF PRICES, &c., UPON APPLICATION.

JOURNAL OF GAS LIGHTING ONE PENNY NEWSPAPER

TO GAS COMPANIES.

WANTED, by the Advertiser (aged 30), who for the last six years has been MANAGER of Gas-Works in an agricultural town in the Midland Counties, a SITUATION in a similar capacity. Would have no objection to serve under an Engineer or Superintendent of larger Works. Can produce references and Testimonials.

Address R. K., 2, Waterloo Place, Pall Mall, LONDON, S.W.

AMMONIACAL LIQUOR to be Let, for One, Three, or Five Years, as may be agreed upon; the whole of the Ammoniacal Liquor (about 300,000 Gallons per annum) produced at the works of the Sunderland Gas Company.

The Contract to commence as soon as settled, or on and from the 1st day of July next.

Further particulars may be known on application to JOHN H. COX, Secretary.

61, Fawcett Street, Sunderland.

TO GASHOLDER MAKERS.

THE Directors of the Northampton GASLIGHT COMPANY are desirous of receiving TENDERS for the supply and erection of a GASHOLDER 100 feet in diameter by 25 feet deep, with Columns, Girders, &c., according to Plans and Specifications, which may be seen on and after Monday the 14th instant at the Company's Offices here, and at the Office of Mr. JOHN EUNSON, Gas Engineer, WOLVERHAMPTON.

Sealed Tenders, addressed to the Chairman, to be delivered at the Offices of the Company on or before Wednesday the 6th of April, and not later than Twelve o'clock noon.

The Company do not bind themselves to accept the lowest or any Tender.

(Signed) WILLIAM DENNIS, Clerk and Secretary.

Gas-Works, Northampton, March 8, 1859.

FOR SALE, by Private Treaty, on liberal terms, a large quantity of Modern and New GAS APPARATUS, of First-Class Material and Workmanship, recently constructed for a Foreign order, but not carried out to the extent anticipated, consisting of Iron D Retorts and Fittings, Hydraulic Mains, Condensers, Purifiers, and 2 Gasholders, each containing 57,000 cubic feet, with several Cast-Iron Tanks and suitable connexions for the whole Works.

Application for particulars to be made to Messrs. W. RICHARDSON and Co., Engineers, Spring Garden Iron-Works, DUDLEY, near Birmingham.

FOREMAN OF GAS-WORKS.

WANTED immediately, for a Small Gas-Work in the Isle of Man, a steady, able man. He will be required to do the whole of the work connected with the Manufacture and Distribution of Gas, from one pair to five Retorts, laying of Services and fixing Meters, with internal Fittings if required. He will have the assistance of a man when necessary. A married man without incumbrance will be preferred.

Wages from 18s. to £1 per week, with apartments, fire, and gas, free.

First-class Testimonials will be required.

Apply, stating age and qualifications, to C. D., Office JOURNAL OF GAS LIGHTING, No. 11, Bolt Court, FLEET STREET.

WANTED, a Station-Meter capable of registering from 3000 to 5000 cubic feet of Gas per hour.

Address, stating full particulars and lowest cash price, Mr. R. W. EGG, Gas-Works, Dartmouth, DEVON.

CONTRACT FOR WORKS.

THE STEYNING GAS COMPANY (LIMITED).

The Directors of this Company are ready to receive TENDERS for the erection of the STEYNING GAS-WORKS, the supply of Apparatus, and the laying of the Mains and Service-Pipes.

The Plans, Specifications, and Forms of Contract will be ready for inspection on and after Monday the 14th inst. at the Registered Office of the Company in STEYNING, and at the Office of Mr. ROBERT SHEPPARD, Engineer, &c., HORSHAM.

Sealed Tenders, endorsed "Tender for Gas-Works," must be delivered to me here on or before Monday the 28th inst., before Twelve o'clock.

The Directors do not pledge themselves to accept the lowest or any Tender.

By order, JOHN INGRAM, Secretary pro tem.

Steyning, Sussex, March 1, 1859.

SOUTH METROPOLITAN GAS-LIGHT AND COKE COMPANY.

NOTICE is hereby given, that an ORDINARY MEETING of the PROPRIETORS of this Company will be held at the London Tavern, in the City of London, on WEDNESDAY, the 6th day of April next, at Two o'clock precisely, to receive the Directors' Report and the Accounts of the Company for the half year ended December 31st last; to declare a Dividend for the same period; and to elect a Director in the place of William Baker, Esq., deceased; and also an Auditor in the place of Benjamin Edgington, Esq., who is now a Director.

Any Proprietor, holding 40 shares, intending to become a Candidate for either of these Offices, must give notice in writing, at the Office of the Company, at least Fourteen days previously to the day of Election.

By order of the Board, THOMAS LIVESEY, Secretary.

Old Kent Road, March 14, 1859.

TO GAS COMPANIES.

WANTED, by the Advertiser, a Situation as MANAGER or FOREMAN of large Works, either at home or abroad. Has had 20 years' practical experience in the Erection and Management of Gas-Works. Is thoroughly acquainted with the modern improvements in Purifying; also in the Manufacturing of Sulphate of Ammonia, Naphtha, &c.

Satisfactory Testimonials can be given.

Address A. B., care of Mr. JAMES WOODLAND, Chapel Street, Blue Town, Sheerness, KENT.

TO CONTRACTORS AND GASHOLDER MAKERS.

THE Directors of the Boston Gas Com-PANY are desirous of receiving TENDERS for the erection of a BRICK TANK, 86 feet diameter by 24 feet deep, and a single lift GASHOLDER for the same.

Plans and Specifications may be seen at the Gas-Works, BOSTON, and at the Office of the Company's Engineer, Gas-Works, Richmond, SURREY.

Tenders to be delivered on or before the 26th inst., addressed to T. F. WHITE, Esq., Solicitor, BOSTON, endorsed "Tenders for Gas Company."

The Directors do not bind themselves to accept the lowest or any Tender.

R. P. SPICE, Engineer.

Richmond, S.W., March 5, 1859.

WROUGHT-IRON Guides for Gas-holders.—Designs and Working Drawings for Trussed Wrought-Iron Guides and Frames can be obtained of CHARLES DIXON, C. E., Chichester, SUSSEX.

KINSON FIRE BRICKS are indestructible by heat, and are warranted to last twice as long as Stourbridge, Newcastle, or Welsh bricks. 80s. per 1000 at Nine Elms Station.

WORKS: POOLE, DORSET.

ON SALE, Two Station-Meters, in Round Cast-Iron Cases, made by Parkinson and Co. in 1847, to pass 10,000 cubic feet of Gas per Hour, and now at work at the Gas-Works, Leicester. Price £40 each net.

Further particulars may be obtained on applying to H. M. ROBINSON, Esq., Gas Office, LEICESTER; or to WEST and GREGSON, OLDHAM.

CHARLES BOTTEN and SON,
ENGINEERS & METER-MAKERS,
CRAWFORD PASSAGE, RAY STREET,
CLERKENWELL, LONDON (E. C.).

Manufacturers of Station and Patent Protector Consumers' Meters, Patent Slide-Valves, Gas-Fittings, Pipes, &c.

Also, High-pressure Cocks, Hydrants, Closets, and all Water-Fittings.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE BRICKS, CLAY RETORTS, LUMPS, TILES,
&c. &c.

LONDON OFFICES:
76, KING WILLIAM STREET, CITY.

A large stock of Fire-Clay Goods always on hand in London, at the lowest wharf prices, at Messrs. CHRISTIE & Co.'s Wharf, 64, Bankside, SOUTHWARK.

JOHN ROGERSON and CO.,
NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

SECOND-HAND Gasholder Wanted, 50 or 60 feet in diameter, in good condition.

Letters, stating the price and name of the manufacturer, and the date when erected, to be addressed to A. B., care of Mr. THOMAS G. BARLOW, 42, PARLIAMENT STREET.

ALFRED PENNY, Engineer,
WENLOCK IRON WORKS,
WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY begs to inform Gas and Water Companies that he undertakes the erection of new, or the alteration of existing, works; and that he may be consulted generally on all matters connected with gas and water supply. He is also prepared to supply best Cold-blast Retorts, Socket-Pipes, and Connections, Iron Borings, &c. &c., and all the necessary Castings used in Gas and Water-Works.

*** Country orders executed with care and despatch.

CROSLEY & GOLDSMITH'S

PATENT SELF-ADJUSTING & COMPENSATING GAS-METERS

CANNOT BE OVER OR UNDERCHARGED WITH WATER,

and they consequently register the quantity of Gas consumed with greater accuracy than Meters in which the Water-Line is variable.

MANUFACTURED BY

CROSLEY & CO.,

GAS-METER MANUFACTURERS,

103, SOUTHWARK BRIDGE ROAD, LONDON.

N.B. The Patent Self-Adjusting and Compensating Apparatus may be applied to the ordinary Meter.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENT METERS, GASHOLDERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c. &c., similar to those used by Mr. King, of Liverpool.

EXTRACT FROM THE REPORT OF MESSRS. LOWE, KIRKHAM, PEARSE, AND BARLOW, ON CROSLEY AND GOLDSMITH'S PATENT METERS.

Our experiments lead us to the conclusion that the patent meter is a practical and substantial improvement upon the ordinary wet gas-meter, inasmuch as the capacity of the measuring-chamber is not diminished by an excessive supply of water, nor can it be increased by drawing off water. On the one hand, therefore, the consumer is protected against any intentional or negligent overfilling of the meter, the result of which is to exaggerate the registered quantity of gas actually consumed; and, on the other hand, the gas manufacturer is protected against the fraudulent abstraction of water by the consumer, the effect of which in the ordinary meter is to cause it to register less gas than is really supplied. Time alone can determine whether these advantages are gained at the expense of its durability, or by any complexity which may render its utility doubtful; but, so far as we are able to form an opinion upon these points, the patent meters are not liable to any greater derangement than the ordinary wet meters, nor do we believe they will be less durable.

(Signed) GEORGE LOWE, *C.E., F.R.S., Engineer-in-Chief to the Chartered Gas Company.*
JOHN KIRKHAM, *C.E., late Engineer-in-Chief of the Imperial Gaslight Company.*
GEDDIE PEARSE, *late Engineer-in-Chief to the Incorporated and Provincial British Gaslight Companies.*
THOMAS G. BARLOW, *Civil and Consulting Gas Engineer.*

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NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, March 29, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 15, 1859.

NOTES UPON PASSING EVENTS.

It is said that everybody has his hobby, and that everybody is exposed to the temptation of riding his hobby to death. Perhaps we ourselves are especially liable to such a remark; for it is certain that our horror of anything like administrative centralization makes us discover traces of its action in many unsuspected cases, and, moreover, it may at times inspire a jealous suspicion of the designs of the advocates of such a system, which the real circumstances do not justify to as full an extent as we are inclined to indulge it. But if we are thus anxious overmuch on the score of an imaginary danger, it certainly does appear that the public in general is, on the contrary, singularly blind to the effects of the insidious, but apparently irresistible, spirit of encroachment by means of which local authorities are being, one after another, brought under the so-called protection and control of the State. And in the din of party warfare, whilst Reform is under discussion, and the foreign relations of the country are so unsatisfactory and so alarming as they are at present, it seems, indeed, like crying in the wilderness to attempt to persuade the public to examine the details of the social revolution which is thus being effected in our country, almost without suspicion or without challenge. Associations for the promotion of true Social Science are, in fact, only too much wanted; both to refute the stupid declamation of the noisy demagogues who utter such trash as we have lately been deluged with about the British Constitution (of whose spirit, by the way, they themselves confess their supreme ignorance, by candidly avowing that they have never *seen* or read it—as if any vital Constitution were ever written), and to call attention to the rights and duties of the respective members of the community. Unfortunately, the Society already organized under the name thus given, has fallen into the hands of the most decided partisans of the school of political philosophers who have already done so much mischief by increasing the sphere of the attributions of the Central Governments; so that it is almost like hoping against hope to endeavour by any isolated efforts to stem the torrent which seems to be hurrying our country, like all the others of Europe, into a state of equality of suffering under a highly artificial system of centralized despotism. It may be asked, in what way do these abstract discussions interest the class of readers we usually address? The reply would be simply to refer the inquirer, firstly, to the history of late years, and to call attention to the increasing burthens cast upon Companies both by the Legislature and by municipal authorities; and then to allude to some of the dangers which still threaten the class of property belonging to associations based upon the principles of private enterprise. But even had we no direct interest in raising the abstract question, its indirect importance to the commercial classes of England is so great, that we feel bound constantly to recall the attention of our readers to the subject.

Within the last fortnight, indeed, some discussions have taken place in Parliament which prove that constant watchfulness on the part of the public is required, in order to protect our society from the introduction of the system which has been so fatal to the liberties and to the happiness of other nations. For instance: in the debate which arose upon the subject of the guarantee to be given by the Government to the Atlantic Telegraph Company, Lord Stanley of Alderley expressed the regret of his friends that the whole of the telegraphic service of the country was not entirely within the control of the Government. Now, without dwelling upon the possibility of the State's thus becoming possessed of this enormous amount of power over the commercial relations of the country, we would observe the practical result of the application of the system Lord Stanley thus advocates has always been disastrous, wherever it has been actually applied. Telegraphic communication is cheaper, more rapid, and infinitely more secure, in our country, than it is in any foreign country where it is a State monopoly. The system of electric telegraphs rose through the exertions of private individuals, and without any support or assistance from the State; and it is worthy of especial notice that no valuable improvement in the system has ever originated in the countries where the Central Administration has succeeded in bringing it under "the cold shade" of official supervision. Even in our postal service we have of late had some bitter experience of the fate we should be likely to suffer were we to give up the control of the Electric Telegraph to Red Tape; and the disgusting insolence with which the Post-Office authorities have presumed to dictate to the public, whom it is bound to study and to serve, may give a good foretaste of the treatment the commercial world would be likely to receive from the *protégés* of Lord Stanley of Alderley and the recent Whig Government.

Then, again, it ought to rouse more than a feeble protest in the House of Commons, when a man like Mr. S. Estcourt could boldly state that the county Magistrates were selected in many cases on account of the identity of their political opinions with those of the Lord Lieutenant of the county for the time being. The functions of the Magistrates are of far too great importance—they are, indeed, too strictly judicial, especially when they are sitting in Quarter Sessions—to allow of its being suspected that they are merely political puppets. Had such a declaration as was thus made by Mr. Estcourt proceeded from a member of the last Government, it would not have excited our surprise; but when it is coolly uttered by a nominal Conservative, and by a leader of that body moreover, there is serious ground for alarm. Gas and Water Companies, unfortunately, are too often brought into contact with, or have to appear before, the Bench of Magistrates to allow such doctrines to be propounded without exciting their attention; and, as many persons connected with those bodies are actually in the Legislature, it is to be hoped that the matter will not be allowed yet to drop. The purity and integrity of even the minor judicial functionaries of a State are of far too great importance to allow of the existence even of suspicion; and it is especially necessary that the body entrusted with the supervision of so much of the county and parochial business as the Bench of Magistrates are, should be free from any accusation of partizanship.

It seems to us also that if our rulers would take the trouble to think for themselves, that even the state of our naval constructions at the present day would read a valuable lesson as to the results of allowing the Central Government to absorb certain branches of manufacture into its own hands. It is said that our Fleet is feebler than it ought to be, and that the manufacturing power of our Dockyards is barely sufficient to deal

with the pressing wants of the nation; but no one seems disposed to ask why ships cannot be built for our Government under contract, and by private ship-builders, as successfully as they actually are built for the wiser powers which do not waste their money in costly Dock establishments. The hull of a very well-formed merchant vessel will not usually cost so much as £20 per ton, whilst a man-of-war hardly ever costs less than £35 per ton. It is true that the latter requires to be put together with more care, and that it ought to be stronger than the former; but surely the difference in quality cannot account for the enormous difference in price, nor is it likely that so many foreign governments would resort to our private ship-building yards if it had not been found that they were capable of producing a very satisfactory class of vessel. But of late years our Government, undeterred by the failures of its ship-building experiments, seems to be anxious to enter into other manufacturing operations, and it has started rifle factories, ordnance foundries, cannon boring works, with the money raised by national taxation, avowedly in order to maintain an overwhelming competition with the private traders who formerly supplied the articles we, the taxpayers, are now compelled to pay so extravagantly for. Yet people wonder at the increase of the estimates, without taking the trouble to analyze them in any way!

There are rumours abroad that the Corporation of London is about to renew its attacks upon the City Gas Company, under the pressure of that medical tyranny which is rapidly taking the place of the priestly tyranny of former times. Most probably this second crusade against a very unjustly obnoxious body will result in as signal a failure as did the first; but it behoves the parties who are interested in the description of property now under consideration, to examine whether some means cannot be devised to put a stop to such constantly recurring causes of anxiety and expense. The whole law of Nuisances has, indeed, been so confused by the modern empirical legislation on the subject, that no Gas-Works in the heart of a town can be considered safe from the attacks of the self-styled Sanitary Reformers; whilst the case of *Broadbent v. the Imperial Company* shows that even distance from dwellings does not constitute an effective protection from persecution. Water Companies, be it observed, are not safer than Gas Companies; and the alarmists of the Thomson and Hassall school are very industrious in their attempts to get up an excitement for what they are pleased to call ostentatiously, by way of distinction, "pure, soft waters." The only effective mode of resisting this aggressive spirit, we repeat again and again, would consist in the organization of a Gas and Water Companies' Association, upon somewhat the same system as the one adopted by the Railway Companies. As the attacks to which this class of property is exposed are carried on by an organized body, able to dispose of considerable funds and to exert great public and political influence, it must be evident, we hold, that a policy of isolation is literally suicidal.

There is a singular dearth of news in matters connected with the interests we are immediately connected with; nor, with the exception of the somewhat out-of-date accounts of the bursting of the Crinan and of the Barnsley Canals, have we seen anything in the recent Journals which should merit observation. In these particular cases, also, it can hardly be said that there is much to call for the remarks of the public generally, beyond the mere fact of the necessity for protecting society from the proximate, or the contingent, consequences of accidents of so fearful a nature as these might easily have become. The Crinan Canal was, by the way, a Government operation, so that it would appear that Government Engineering is by no means more infallible than that of private Companies; but, be this as it may, the great question still remains to be solved, as to who are the parties responsible, and to what extent are they liable, when accidents of this peculiar nature occur. Surely a canal bank cannot give way without some previous indication of danger; and we suspect that in both the cases we have referred to, there must have been sad neglect on the part of the officers charged with the inspection of the respective works, or else that the superior administrations of the Canals were seriously to blame.

We have called attention to these stories of the accidents upon the Crinan and Barnsley Canals, however, less for the purpose of dwelling upon the conditions and circumstances of the accidents, than for the purpose of reviving, if possible, a discussion with respect to the use of many of the existing lines of artificial water communication. Evidently, at the present day, there is a tendency on the part of commercial men to abandon the use of the slow, even though economical, method of canal transport, and to resort to the more costly, but more rapid and certain, mode of sending goods by rail. Sooner or later, therefore, we anticipate that the question must rise as to what is to be done with many of the lines of artificial navigation, created at so great an expense within a period so close to our own times. The very state of abandonment in which those Canals are left renders the danger of accidents, such as we have referred to, only the more imminent; for the superintendence of a non-paying concern is usually very laxly performed. It becomes, therefore, a question of general interest, as to what should be done with the Canals which cannot support themselves, and how their efficient maintenance is to be secured. For our own parts, we are inclined to believe that in many cases it would be practicable to convert the lines of artificial navigation into feeders of systems of irrigation; and that, with a little care and attention, it would be easy to organize upon Canals a system of carriage which should ensure a preference for that mode of locomotion, over the more expensive mode of transit offered by Railways. Yet nothing seems likely to be done by the Directors of Canal property for the protection of their own interests; and the only lesson people seem disposed to learn from the occurrences upon the Crinan and Barnsley Canals is that, to use the parrot cry of the day, "Government supervision is necessary to protect the public from accidents arising from the neglect in maintaining the works of old Canals."

And here we cannot refrain from expressing the great satisfaction we have felt in reading the portions of the last Report addressed by Mr. Haywood to the Commissioners of Sewers of the City of London, in which that gentleman, after alluding to that fashionable cry—uttered principally, be it observed, by the most arrant place-hunters of the day—"for the granting of augmented powers to the District Surveyors, or other public officers, or for an increased number of them, and for the more vigilant and constant supervision of buildings," goes on to say that "this expectation of guarding against all possible calamities by official care and inspection appears to be very general." Mr. Haywood then proceeds to observe that he is convinced that the accidents by the fall of houses, &c., which have given rise to this cry, have been such "that no amount of official inspection will prevent their occasional occurrence; but, on the other hand, it is greatly to be feared that, by leaning so much upon official supervision, by attempting to lay the *onus* of guarding against those calamities upon the District Surveyors, or other functionaries, *the sense of personal responsibility of owners, occupiers, builders, and architects, specially connected with the buildings, will be weakened.*" These are, in fact, the very principles for which we have always contended in this JOURNAL; and it is with a deep conviction of their truth that we again express our conviction of the mischief which will result from their neglect. Unfortunately, Mr. Haywood seems to have as little faith in the common sense of his readers as we have in the power of his, or our, observations to stem the torrent which is so rapidly carrying us towards bureaucracy.

Amongst the measures brought injudiciously before the Legislature of late, there is one whose inevitable fate we regret very sincerely. This is the bill for providing places of recreation at the expense of parishes; for we believe that something requires at once to be done in the matter, and that if the State be justified in doing anything for the benefit of the poorer classes, it would be in providing play-places for their children. Alas! few of the wealthy seem disposed to visit the very poor at home, or to render to themselves a distinct account of their sufferings. We are, from circumstances, compelled to examine these things more closely; and therefore it is that, knowing the full extent of the present evil, we regret the probable failure of the well-intended efforts of Mr. Slaney and his friends. Why will they not consult some competent person who should be able to correct the constitutional defects of the measures hitherto introduced for the purpose of securing so desirable an object as the one they seek to achieve? It is to this simple neglect of the legal common sense, so to speak, of such operations that the failure of so many of the modern attempts to improve the condition of the poor must, we think, be attributed; and were we to seek another striking and painful illustration of the danger of the fashionable ignorance of the principles it is necessary to bear in mind, even in attempting to achieve philanthropic objects, we know of none so striking as that which is offered by the practical failure of

the Baths and Washhouses Act. Convinced as every well-wisher for the improvement of the physical condition of our poorer classes must be of the importance of securing the means of cleanliness for the old, and of healthy recreation for the young, it must be a source of bitter regret to them to observe the wrong-headedness of so many of the most active labourers in their field of predilection. The gravest error of these amiable, but mistaken enthusiasts consists, however, we believe, in their neglect of the principle of calling into play the independent energies of the parties who are most directly to be benefited; and thus again are we brought round to the point from which we started—namely, that no great or permanent good can be effected, unless they who are immediately concerned are allowed to conduct their own business in their own manner. We propose hereafter to consider more in detail the result of the Baths and Washhouses Act; and in the meantime would request our friends upon the respective Vestries to favour us with a statement of the working expenses and of the receipts of the establishments in their districts. At present, however, we cannot refrain from again expressing our regret that the working of the Recreation Grounds Bill should be jeopardized by the practical errors of its framing: perhaps the House of Lords may still remedy the defects of the measure.

Circular to Gas Companies.

We imagined that the oil-of-vitriol controversy had been satisfactorily disposed of, and that the notion that the combustion of purified coal gas generates sulphuric acid had been consigned for ever to the same limbo of exploded fallacies as the notion that the sun goes round the earth, or that the latter is an immoveable extended plane. It seems, however, that certain absurdities possess inextinguishable vitality, and after they have been dead and buried and forgotten, or remembered only as the wild fantasies of ignorance, they are from time to time resuscitated with solemn gravity, and with as much pretension to be veritable truths as if they had not been years before indisputably proved to be based on error and altogether fabulous. A remarkable instance of this kind recently occurred at a meeting of the Society of Arts, at which a communication was read from Dr. Letheby, again asserting—with an amount of assurance indicating complete obliviousness of the exposure of his ignorance of the subject four years ago—that the destruction of books in a library is attributable to the generation of sulphuric acid by the burning of gas. The question has again arisen, *à-propos* to the discussion respecting the preservation of books, and Dr. Letheby seized the opportunity to revive the controversy by reasserting as established facts the baseless fictions of his own imagination, which we had good reason to presume he was long since made thoroughly ashamed of. The oblivious Doctor now says—

> It is *not sufficiently well known* by the public that gas contains a large amount of sulphur in a form that is not readily discovered. This, by combustion, is converted into sulphurous acid, which, by absorption of atmospheric oxygen, *quickly becomes oil of vitriol;* and it is hardly necessary to say that wheresoever this corrosive acid fixes itself upon any textile fabric, it slowly but surely exerts its destructive power. The leather binding of books is from its porous nature peculiarly apt to absorb the acid, and hence it is more seriously injured by it than other tissues. The proportions of sulphur in coal gas are very variable, but the results of a large number of experiments seem to show that the average amount is about 20 grains in every 100 cubic feet of gas. This will produce about 50 grains of anhydrous sulphuric acid, or rather more than 61 grains of the strongest oil of vitriol of English commerce.

As the oil-of-vitriol bugbear is thus revived, it may be as well at once to put it down by recapitulating the evidence by which it was "quietly inurned" at the time it before attempted to frighten gas consumers out of their propriety. The opinions and experiments of Dr. Leeson and Mr. Warington—who were applied to by the directors of the Chartered Gas Company in 1854, when Dr. Letheby first created the bugbear—confirmed and strengthened as those opinions were by the experiments of Mr. Lewis Thompson, recorded in this Journal, proved:—that free sulphuric acid cannot be retained in a vaporous condition in the atmosphere at a lower temperature than an approach to red heat; that sulphurous acid does not become oil of vitriol by the absorption of atmospheric oxygen, and not even by exposure to pure oxygen gas; that the proportion of sulphur in purified gas, as supplied by the gas companies, exists in only an infinitesimally small quantity; that any sulphur contained in coal gas combines immediately, during combustion, with the ammonia that is always present in it, to form that perfectly harmless substance, sulphate of ammonia; and, furthermore, that analyses of the vaporous products from the ordinary combustion of gas shows the total absence of free sulphurous or sulphuric acid.

The latter fact, it might be presumed, if established, would set the question of the production of oil of vitriol by the combustion of gas at rest for ever, and to the manner of proof there cannot be the least objection. Mr. L. Thompson suspended a globular vessel filled with ice near the ceiling of a room lighted with gas, on the outside of which vessel the heated vapour of the room quickly condensed, and was collected. The water thus formed would of course be impregnated with all the vaporous products of combustion, and had any free acid been present, it would have been manifest in the condensed vapour; but not a trace of sulphuric or of sulphurous acid was perceptible. This was not an isolated experiment on a small scale, but it was repeated, under various circumstances, in atmospheres highly heated by gas, and on a scale indicated by the production of forty gallons of water; and in all cases with the same result. The sulphate and the formiate of ammonia were present, but there was no trace of sulphuric or sulphurous acids.

It is admitted, indeed, that all coal gas contains a small proportion of bi-sulphuret of carbon, which no known process of purification can remove without destroying the luminous properties of the gas; but that portion of sulphur is so small as to be almost inappreciable, and the quantity of ammonia that always remains in the gas is more than sufficient to neutralize the sulphurous acid at the instant it is produced during ordinary combustion, and forms the innoxious substance, sulphate of ammonia. It is true that by directing a jet of coal gas on a ball of spongy platinum—as practised by Dr. Letheby—the conditions of combustion are so changed that sulphurous, and even sulphuric acid may be procured by skilful manipulation; but it would surpass the power of a much cleverer manipulator than Dr. Letheby to obtain those products from the combustion of coal gas by an ordinary burner.

But it may be urged, that notwithstanding chemical analyses to the contrary, there remains the undisputed fact, that in the Athenæum library, and in other libraries where gas is consumed, the bindings of the books crack, the leather dries and crumbles, and is reduced to powder. There is, indeed, no gainsaying established facts, but differences of opinion may be allowed as to their cause. Dr. Letheby's syllogism is—The bindings of the books in the Athenæum library are destroyed; the Athenæum library is lighted by gas; *ergo*, it is the gas that destroys the bindings. That is the kind of logic by which certain wiseacres have attempted to prove the destructive agency of gas; but by altering the terms of the syllogism—by bringing into consideration other agencies operating in the same library—it might be proved, even still more conclusively, that it is the breath of the members, the perspiration of their bodies, or the heat of the coal fires, that destroys the bindings of the books. Those who delight in the syllogistic form of reasoning may satisfy themselves that the much-abused gas is free from the imputation of destroying, by concocting a formula founded on the fact that in libraries not lighted by gas the bindings of the books are equally destroyed by cracking and crumbling. That fact was stated by several speakers at the meeting of the Society of Arts; and it was, indeed, affirmed by Dr. Leeson and Mr. Warington in 1854, that the leather used for the binding of books "is very subject to decay, and, when exposed to a heated and vitiated air, soon becomes friable and rotten; this decay has been observed in many old libraries long before gas was known." Another proof, if more were needed, that it cannot be from the action of sulphuric acid generated by the combustion of gas that the bindings are destroyed, is to be found in the character of the destruction produced. Were sulphuric acid the destroying agent, the strong attraction of that acid for moisture would cover the books with damp and mould; but the species of decay they suffer from renders the leather dry and reduces it to powder.

After the foregoing *résumé* of the evidence by which the oil-of-vitriol bugbear was effectually scouted out of belief when first set up by Dr. Letheby, it may be unnecessary to say more; but we cannot forbear noticing the exemplification he affords of straining at a gnat and swallowing a camel. The quantity of oil of vitriol generated by the combustion of gas in London, according to his assertion, amounts to 1200 tons per annum; and he expatiates on the injurious effects produced by the diffusion of that quantity of corrosive acid in the atmosphere. Whilst thus directing attention to the danger and injury arising from an imaginary quantity of corrosive vapour gene-

rated by the combustion of gas, he altogether excludes from his sight the enormous quantity of acidulous vapour that must actually be generated by the combustion of coal. The average quality of coal contains 1½ per cent. of sulphur, and coke contains about 1 per cent.; and, assuming the annual consumption of coal in London to be 3,500,000 tons, and of coke 300,000 tons, there are no less than 55,500 tons of sulphur discharged into the atmosphere of the metropolis every year; which quantity would, according to Dr. Letheby's own showing, produce the enormous amount of 166,500 tons of oil of vitriol! The learned, sensitive, discriminating, but very oblivious and not over-logical Doctor is extremely apprehensive of danger to the public health and to the backs of books by the combustion of gas, from which nearly all the impurities of coal are extracted; but he cannot perceive any danger from the 166,500 tons of oil of vitriol which by his own theory must be discharged annually into the air by the combustion of coal and coke. He may truly boast of a microscopic vision which magnifies atoms to the size of mountains, whilst the mountains themselves he cannot see.

The recent proceedings in the appeal of the Wakefield Gas Company against a rate made by the overseers upon their works in that township (the first portion of which report will be found in another column), is a fair sample of the extortion to which gas companies are exposed through the unsound interpretation given by the Court of Queen's Bench to the term "rent" in the Parochial Assessment Act. The hardship of this case is peculiar, and it *must* compel the Legislature to devise some means by which the repetition of such scandals may be prevented. Here the overseers took upon themselves to raise an assessment from £1270 to £2845, in a town where the rates are 6s. 8d. in the pound, on the representation of some speculative individuals (who admit they know nothing of the subject), that the gas-works and trade connected therewith would let to an imaginary tenant for £3000 a year or upwards, and the gas company have had to incur an expense of some £1600 or £1700 in defending themselves against this imposition. Success has only partially attended even this lavish expenditure of money, as the arbitrator has awarded a reduction of only £851, so that the gas company will derive no relief whatever from their limited success for six years to come, the saving effected in the rates during that period being swallowed up by the expenses. So also with the parish authorities, who will derive no benefit from the increase established in the assessment for a similar period.

Unfortunately for the Wakefield Gas Company, there are no large manufactories within the township, and there are consequently no means by which the Court of Queen's Bench could be called upon to reconsider its dictum, as laid down in the West Middlesex Water Company's case, with regard to what constitutes "rent," or to say whether all manufactories should be rated upon "the profit remaining after all deductions have been made from their receipts." Unless some speedy legislation takes place with the view of determining what rent really is within the meaning of the Parochial Assessment Act, this question must be raised, and any company carrying such a case to the Court of Queen's Bench will be entitled to the cordial assistance and substantial support of every gas company in the United Kingdom. As long as the unsound precedents established by the existing decisions remain in force, every gas company is in danger of being similarly victimized by a host of lawyers and surveyors, who, by ingeniously distorting those precedents, have contrived to reap a plentiful harvest in the litigation to which they have given rise. If their interpretation of the law be correct, then let every one liable to be rated, be so on the same basis; but gas companies justly object to be singled out and mulcted of a large portion of their legitimate earnings, while ninety-nine out of every hundred of their fellow ratepayers are exempt from such extortionate demands. The rates would have absorbed a sum equal to 2 per cent. per annum upon the whole capital of the Wakefield Gas Company had the assessment been maintained; and the small modicum of relief granted has only been gained by the sacrifice of double that amount for one year. These figures afford some measure of the injustice and oppression committed under pretence of administering a law which the judges have declared it is impossible to apply to a large class of interests that have risen up since its enactment, and which law they have on many occasions urged the Legislature to revise.

The intimation conveyed in our last of the probable retirement of some of the members of the committee on the Metropolitan Gas Inquiry has been confirmed, and two new members, Mr. Ayrton and Mr. John Abel Smith, have been nominated to serve in the place of Sir Benjamin Hall and Mr. Roupell, who have withdrawn. At the first meeting Mr. Byng was chosen chairman of the committee, and four members—Mr. John Locke, Sir John Shelley, Sir W. Hayter, and Mr. F. W. Russell—were appointed to confer with the representatives of the gas companies and with the delegates, with the view of arranging the basis of a compromise. Several private conferences have since taken place, and a public meeting of the committee was to have been held yesterday to resume the inquiry; but, as an adjournment till Friday next was agreed to, we presume there is some probability of the negotiations being successful. Sir John Shelley has, however, given notice of a motion for an address for—

A return of the name of all gas-works established under Acts of Parliament in England and Wales, and where situated; stating in columns the maximum charge per 1000 feet fixed in each Act of Parliament; the maximum and and also the minimum charge actually made per 1000 feet to private consumers; the price per 1000 feet for gas only supplied to public lamps; the average number of cubic feet of gas produced from a ton of coal used at the respective works; amount of coal in tons used at the several works in each of the last three years, and the price paid for coal in each of the last three years; and the amount realized from the sale of residual products during the same term.

Whether the motion is to be persisted in will, we apprehend, depend upon the turn which these negotiations may take; but gas companies, knowing the object which it is intended to serve, will do well to pause before complying with such inquisitorial demands.

Register of New Patents.

1793.—CHARLES FELTON KIRKMAN, of Argyll Street, Regent Street, London, for "*An improved mode of treating sewerage for agricultural uses, and for machinery to be employed therein.*" Provisional protection only obtained. Dated Aug. 6, 1858.

This invention relates to a mode of constructing machinery for grinding, amalgamating, and deodorizing sewerage, and removing the impurities from the liquid, so that the water only will be permitted to pass away. The machinery is so constructed that the solid parts of the sewerage, filth, rags, vegetable, animal, and other substances, as they flow from the mouths of the sewers, will be crushed and ground up, and then pass to another part of the machine in which they will be united with a sufficient quantity of some effective deodorizing and disinfecting agent, and then conveyed by pumps or other suitable means to a receiver, in which the heavy sewerage will deposit itself, facilitated by the artificial means which have been applied to it on its way down from the sewer, and the impurities being removed, the water will pass off in a pure state.

1803.—JOHN TAYLOR, of Roupell Park, Streatham Hill, Surrey, for "*Improvements in the manufacture of blocks for the construction of sewers and drains.*" Patent dated Aug. 7, 1858.

This invention has for its object improvements in the manufacture of blocks for the construction of sewers and drains. For this purpose blocks of clay or brick-earth, or other suitable material, are produced by moulding or by expressing through moulding-dies of the following form:—The inner surface is concave, and of a curvature corresponding with the inner curvature of the intended structure. The sides are inclined to correspond with the section of the circle or curve it is intended to produce by a series of such blocks. The outer surface of each moulded block is formed with a longitudinal rib, by preference of a section, agreeing with the sizes of the bricks to be used therewith. These moulded blocks should be made of clay or brick-earth of the best description, or of other material capable of producing hardness, and they may, if desired, be glazed, and have longitudinal passages formed through them.

In using such a block to produce a section of a sewer, whether from an invert or otherwise, a mould such as is now employed is used. One of the blocks is introduced therein, then the mould is filled in with brick, and cement is run in as heretofore. By these means the number and extent of the joints in the interior of a sewer, or other structure, will be greatly reduced. When making blocks with concave upper surfaces and convex under surfaces (suitable for the construction of sewers and drains) by the use of several bricks introduced into a mould, and then run in with cement, in place of making such blocks with ends and sides suitable for producing butt-joints all round, as heretofore, each block is formed of two or more layers of bricks, by preference of two layers, of like dimensions, but arranged in such a manner that the upper layer is caused to overlap the under layer at one end and one side, and at the same time the upper layer falls short of covering the under layer at one side and one end, so that when the several bricks composing a block are cemented together into a block, it will, in use with other like blocks, be (when constructing a sewer or drain) supported by, and give support to, other neighbouring blocks, and the blocks in use will be arranged to bond and break joint, by which great strength of structure will be obtained. In some cases, in order to bond the upper with the lower layers of bricks, other bricks of a suitable form are used, which enter into, and form part of, both layers of which a block is composed.

In producing blocks for the central part of the invert of a sewer or drain, the lower layer of a block is made of larger dimensions than the upper layer, so that the under layer may project beyond the upper layer on the two sides and at one end, the upper layer overlapping and projecting beyond the under layer at the other end. Similar forms of blocks may be made by expressing clay through moulding orifices, the sides

overlapping, as above explained, and when cut into suitable lengths the ends may be so cut as to overlap as above described. In this case it is preferred that they should be hollow longitudinally, and the hollow spaces of all such and like descriptions of hollow blocks used in the construction of drains and sewers are filled in with concrete, either applied before or when laying them.

1821.—François Haeck, of Schaerbeck, near Brussels, Belgium, gentleman, for "*Improvements in the construction of cocks, taps, or valves.*" Patent dated Aug. 10, 1858.

The barrel of the cock or tap is formed with a conical or spherical seat, covered with a layer or sheet of indiarubber or other elastic waterproof material, or of lead, and the closing of the passage therethrough is effected by a conical or other form adapted to fill out the indiarubber or other material used as a coating to the seating. The inner end of this closing means is formed with a disc, which fits the cylindrical portion of the barrel within which it is capable of traversing. This disc is perforated near its edge with a series of holes, which together, it is preferred, should be of the area of the passage through the seat. The other end of this closing means is formed with a stem, by which it is operated for closing or opening, and this stem may be formed with a screw to turn in a female screw formed in a fixed part of the cock or tap, or it may have attached to it one end of a cylindrical or other form of indiarubber, the other end of which is fixed to the barrel of the cock or tap, with a tendency to keep the passage closed or to close it when opened. The parts of the tap or cock may be made of porcelain or metal, or partly of porcelain and partly of metal; and the improvements are also adapted to the formation of valves and their seats.

The claim is for the mode of constructing and arranging the parts of cocks or taps and valves substantially, as explained.

1895.—Louis Felix Henri Droinet, of Paris, for "*Improvements in bearings and packings for rotating and reciprocating shafts, the joints of pipes, and other like purposes.*" Provisional protection only obtained. Dated Aug. 20, 1858.

These bearings and packings are composed of three or more segmental blocks, which, when brought together, form a circular hole on the inside for the reception of the shaft or pipe. Each segment is pressed inwards by a spring or springs. Two or more rows of these segments may be used one over the other, and the segments in one row should be arranged so as to break joint with those in the other row or rows.

1907.—Richard Laming, of Hayward's Heath, in the co. of Sussex, for "*Improvements in purifying gases and liquids, in preparing purifying liquids, and in apparatus for apportioning or measuring liquids.*" Provisional protection only obtained. Dated Aug. 21, 1858.

This invention consists—

1. In removing sulphuretted hydrogen from foul gases by the catalytic use of certain metals in combination with oxygen—as, for example, the precipitated sesqui-oxide or peroxide of manganese.

2. In removing sulphuretted hydrogen from gas liquor or other foul liquids by the use of the reagents above indicated.

3. In a "tumbling box," or fluid measurer, controlled by a weight spontaneously shifting, as need requires, from one part of the apparatus to another.

1909.—Francis Puls, of Roxburgh Terrace, Haverstock Hill, in the co. of Middlesex, chemist, for "*Improvements in the distillation of coal.*" Patent dated Aug. 23, 1858.

This invention, which has reference to the distillation of coal, consists of an improved mode of distilling coal of any description, with the addition of earthy alkaline or metallic oxides, peroxides, or protoxides, or the carbonates or hydrates of those substances, or a mixture of any two or more of the substances above mentioned, for the purpose of obtaining gaseous products and tar from the coal distilled.

The mode of operating is the same whether lime or chalk (carbonate of lime), or any other of the above-mentioned substances be mixed with the coal. Small coal, or coal broken to pieces, is placed in a retort, either in layers alternately or otherwise, well mixed, surrounded and covered with about an equal bulk of slaked or hydrate of lime, or damp chalk, which it is preferred to use in powder. The whole is then subjected to a low red heat until the coal ceases to evolve any condensible vapours. Those parts of the gaseous products which consist of condensible vapours may be condensed by any of the known means, and the more volatile oils contained in the product may be separated by distillation, and the heavier oils may be separated from the solid by pressure, suction, or any other known processes. These oils will require very little purifying, owing to the purifying properties of the substances with which the coal has been distilled. The gas is collected in gasholders of the ordinary description connected with the condensing apparatus, and the gasholders may be so regulated as to act as a suction apparatus, to remove the vapours more quickly from the retorts. The gas evolved during the distillation may be purified and used for lighting or heating purposes, as may be desired. The residuum remaining in the retorts may be sifted, and the coke or breeze may be used as fuel for heating; and the powder, which will contain the greater portion of the lime or other substances originally mixed with the coal, may be used again—that is to say, may be mixed with a fresh quantity of coal intended to be distilled, as above described.

But, in order to deprive this powder of as much of its carbonaceous matters as practicable before using it in this manner, it is exposed to the open air immediately after it is withdrawn from the retort, and whilst still glowing hot, so that the carbon may be burnt out of it.

When the coal to be distilled is mixed with any of the other oxides, carbonates, or hydrates above mentioned, or any mixtures of them, the process is the same as above described, when using lime or chalk.

The claim is for the distilling of coal when mixed with any of the earthy alkaline or metallic oxides, carbonates, or hydrates above mentioned, or any mixtures of them, for the purpose of obtaining the gaseous products and tar arising from such distillation, in manner hereinbefore described.

1910.—Francis Puls, of Roxburgh Terrace, Haverstock Hill, in the co. of Middlesex, chemist, for "*Improvements in the distillation of bituminous matters and gas tar.*" Patent dated Aug. 23, 1853.

The claim is for the distilling of bituminous matters (including gas tar), when mixed with any of the earthy alkaline and metallic oxides, carbonates, or hydrates above mentioned, or any mixtures thereof, in manner above described, for the purpose of preventing the adhesion of the residuum to the retort, and obtaining the products arising from such distillation.

1935.—Samuel Newman Rodier, of 21, Oak Village, St. Pancras, London, for "*Improvements in apparatus for regulating gas.*" Patent dated Aug. 26, 1858.

This invention has for its object improvements in apparatus for regulating gas. For these purposes, when the apparatus is to be applied to each burner, there is introduced a small chamber below or near the burner. The gas is supplied to this chamber by means of a pipe, the exterior of which it is preferred should be largest at its upper end, and tapering downwards. At the upper part of this supply-pipe there are notches or openings for the gas to pass through. Over the supply-pipe is a light hollow cap, the interior of which corresponds in form with the exterior of the supply-pipe, but so much larger in diameter as to admit of the gas flowing freely down between the interior of the cap and the exterior of the supply-pipe when the cap is resting on the top of the supply-pipe. The lower part of the cap is so formed that when lifted by the pressure of the gas, the lower edge of the cap comes nearer and nearer as the cap is more and more lifted to the supply-pipe, and thus reduces the size of the passage or space which is between the interior of the cap and the exterior of the supply-pipe. It is preferred, when very light caps are used, to form the tops thereof of talc, though other materials may be used; and in order to prevent the cap (or it may be called the supply-valve, for it regulates the supply of gas to the burner) from rising too quickly in case of any sudden change of pressure, there is a chain, or series of light links or weights, suspended over the cap, and these are lifted in succession as the cap is raised by the pressure of gas. When a regulator is to be used to regulate a series of burners, then similar apparatus is employed of larger dimensions, according to the number of burners to which the same is to be applied. The burner-tube is fixed to the chamber by means of a screw, by which the height to which the cap may be raised by the pressure of the gas may be regulated, or the extent of movement of the cap or valve may be otherwise regulated.

The claim is for constructing and combining apparatus for regulating gas as herein described, and also the use of a rising and falling cap or valve, so arranged that when it is lifted by the pressure of the gas, its lower edge comes nearer and nearer to the supply-pipe, so as to reduce the size of the passage for the gas as herein described.

1944.—Frederick John Evans, of the Chartered Gas-Works, Horseferry Road, Westminster, engineer, for "*An improvement applicable to gas purifying.*" Patent dated Aug. 27, 1858.

In the purifying of illuminating or carburetted hydrogen gas it is now the general practice to employ some preparation or natural compound of oxide of iron for the removal of the impurity known as sulphuretted hydrogen. These oxides of iron have usually been obtained either from natural sources in the form of ochres or natural oxides, or from the decomposition of the sulphates or other salts of iron; all ochres or natural or native oxides, however, are mixed with earthy matters, which, having no affinity for the impurities contained in gas, are consequently inert and useless ingredients. The oxides obtained by the decomposition of the sulphates or other salts of iron are purer, but are much more costly to obtain; and although they admit of being frequently revivified, yet their use forms a heavy annual item of expense in the gas-works.

The object of this invention is to obtain a material which will be energetic in its action, easy of production, and inexpensive. To this end turnings, borings, and filings of iron, or scrap or small pieces of iron, are taken, in the form of shot for example, and the same are exposed to such gases or liquids, whether at ordinary or elevated temperatures, as will ensure their rapid oxidation. When the surfaces of the turnings, borings, filings, or thin pieces of iron are completely coated with oxide or rust, the metal thus oxidized is ready for use in the dry gas purifiers, where it is to be employed in the manner usually practised when purifying gas with the oxides above referred to. That is to say, a set or series of purifiers is employed, the same being suitably connected together by pipes; and the gas is led through the several purifiers in succession, entering first that which contains the purifying material most impregnated with sulphur, and passing last through that in which the oxide is the least impregnated with sulphur. The impure gas being thus allowed to percolate through the mass of oxide of iron contained in the several purifiers, certain of the impurities contained in the gas will be arrested and caused to combine with the oxide of iron. On the oxidized iron turnings, &c., in the first purifier becoming saturated with the impurities deposited by the gas—which is shown by the test constantly applied to the gas by the attendant—that purifier is thrown out of action, and the gas is led to the second, which becomes in its turn the first purifier, and a freshly charged purifier is brought into the series. The saturated oxide is then removed from the purifier, and exposed a second time to the action of the atmosphere. A portion of the sulphur that has been extracted from the gas, and taken by the iron into chemical combination, will then become separated therefrom, and the oxide of iron will return to its original state, and be fit for purifying gas as before. The mode which the patentee prefers for converting iron filings, turnings, and borings and scrap iron into a purifying material, is to mix the same with the saturated purifying material immediately it is removed from the purifier, when the chemical action of revivifying, set up by exposure of the material to the air, will assist in effecting the rapid oxidation of the iron, which may then be used with the revivified oxide for the purification of gas.

To prepare the oxide in the first instance, supposing no saturated material to be at hand, the inventor spreads out the filings, turnings, or scrap iron on the ground, and exposes the heap to the atmosphere, either with the addition of water or not, according to the state of the atmosphere. When so exposed for about twenty-four hours, more or less, the surfaces of the particles or pieces of the metallic iron will be found to be coated sufficiently with rust or oxide to serve as an efficient purifier of gas from sulphuretted hydrogen.

When by repeated revivification and use the purifying material is found

to have increased in bulk by the mechanical admixture of sulphur therewith, derived from the impure gas, so as materially to impair its energetic action, he submits the material to a furnace heat, as heretofore practised, in order to burn or drive off the sulphur, after which the material may be again used as an efficient purifier.

Having now set forth the nature of this invention of "An improvement applicable to gas purifying," and explained the manner of carrying the same into effect, the patentee wishes it to be understood, that under the above in part recited letters patent he claims the treatment and use of metallic iron in the manner and for the purpose above described.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

368.—George Bower, of St. Neots, Hunts, gas engineer, for "*Improvements in apparatus for the manufacture of illuminating gas.*" Feb. 9, 1859.

441.—Samuel Thomas Cooper, of Upper Clapton, gentleman, for "*Improvements in the use and application of artificial light.*" Feb. 17, 1859.

473.—George Humphrey, of Deptford, Kent, engineer, for "*Improvements in meters for measuring fluids and gases.*" Feb. 21, 1859.

490.—Samuel Ridge, of Hyde, Chester, millwright, for "*Improvements in coupling or making the joints of pipes and other articles.*" Feb. 23, 1859.

491.—William Ashton, of Heaton Norris, Lancaster, for "*Improvements in gas-regulators.*" Feb. 23, 1859.

508.—Alfred Cornelius Keily, of Silchester Road, Notting Hill, for "*Improvements in apparatus for drawing off fluids.*" Feb. 24, 1859.

527.—John Leigh, of Manchester, surgeon, for "*Improvements in the purification of coal gas.*" Feb. 28, 1859.

539.—Rev. Henry Moule, clerk, M.A., Fordington, for "*Improvements in apparatus applicable to the evaporation of sewerage or other waters, and for affording heat for other uses.*" March 1, 1859.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED INVENTIONS.

322.—George Henry Baylis, of 13, Vauxhall Walk, Lambeth, London, and Francis Robinson, of 88, Salisbury Street, Lisson Grove, London, for "*An improved indicator for registering the withdrawal of liquids from vessels.*" Feb. 4, 1859.

413.—James Copcutt, of 26, Kirby Street, Hatton Garden, London, for "*Improvements in obtaining light from gases.*" Feb. 14, 1859.

Legal Intelligence.

WAKEFIELD GAS COMPANY'S APPEAL.

(*Before* P. A. Pickering, *Esq., Q.C., Arbitrator.*)

THE WAKEFIELD GAS COMPANY, *Appellants*; THE OVERSEERS OF WAKEFIELD, *Respondents.*

At the Yorkshire West Riding Sessions, held at Leeds on the 20th of October last, the Wakefield Gas Company appealed against their assessment to the poor-rate. By mutual consent the matter was referred to Mr. Pickering, who was empowered to arbitrate between the parties, to decide the question of costs, and if necessary to state a case for the opinion of the Court of Queen's Bench, if he found any difficulty in deciding upon the principle to be adopted in settling the rateable value of the appellants' property.

The learned arbitrator held his sittings at the Royal Hotel, Wakefield, on the 21st of December last and three following days; and by adjournment at the King's Arms, Westminster, on the 11th, 12th, and 13th of January, and on the 3rd of February and three subsequent days.

Mr. Maule, instructed by Messrs. Lumb and Sons, appeared for the appellants; and Mr. Shaw, instructed by Mr. Whitham, appeared for the respondents.

The order of reference having been read, and the grounds of appeal put in,

Mr. Shaw opened the case on the part of the respondents. He said he should not at present make any lengthened statement, as he should have an opportunity at the close of the evidence of commenting upon the whole of the facts. The appellants were rated in June last upon the sum of £2845 in respect of gas-works and mains in the township of Wakefield, of which they were owners and occupiers; and although in the notice of appeal there were many grounds taken, yet the real question for the arbitrator would be, whether they were rated in too large an amount. The appellants were in the year 1822 incorporated by an Act of Parliament, and their capital was fixed at £12,500. The consumption of gas had largely increased up to the year 1847, at which time the sum of £25,000 had been expended in works and mains, and in that year it was found necessary to apply to Parliament for additional powers. An Act was obtained in 1847, by which the appellants were empowered to create 1500 new shares of £5 each, and to borrow £10,800, making the total sum of £43,300. It would appear that from 1847 to 1856 a very considerable increase had arisen in the use of gas, for another Act of Parliament was then applied for and obtained, and in the preamble of that Act it was stated that the demand for gas having greatly increased, they, the appellants, had, by the creation of shares, raised all the money, viz., £43,300, which they had authority to do by the Act of 1847, and that it was necessary, in order to meet the further requirements of the public for gas, that they should be empowered to raise by shares and loans a further capital of £36,000. Here, then, by the admission of the appellants, was established a prosperous company, and having unquestionably a right of supplying gas without any competition. Now, according to this state of things, it was clear that the lowest value of the works and mains in 1858 was £43,300. Inasmuch as the directors of the company were sensible and shrewd men of business, it would be apparent that they had laid out this large capital advantageously; and, indeed, if any corroboration of this proposition was wanted, it was to be found in the fact that a dividend had been annually divided upon it of 10 per cent., after, of course, a deduction for outgoings of every description. In the present case, therefore, the question was, What would a tenant give from year to year to enter upon the gas-works as they existed at this time? Every additional outlay of capital upon the works had increased their annual value; and if, in the instance now before the arbitrator, it was found that this sum of £43,300 had been judiciously expended in enlarging the means of making and supplying gas (the proof of which was seen in the 10 per cent. dividend), then it would be beyond all dispute that they had been rendered more valuable to a tenant. The respondents were entitled to have the rate assessed upon the annual rent of the works to be given by a tenant, and that annual rent might in part be gathered from the fact that the landlords, or in other words the company, had laid out upon them the sum of £48,300, being £43,300 raised by shares, and £5000 by a loan. He would prove by persons of competent information and skill, that these premises would let to a tenant for at least £3000 per annum; that a tenant who entered upon them would require little, if any, capital,—for his outgoings would be simply wages of labour and ordinary repairs, with payments every three months for coals, whilst he would be at the same period receiving payment for coke sold, and once in three months or once in six months the gas-rents would be paid by consumers. The company had 88 retorts, and on an average 45 of these were in action. This, according to the evidence which he should produce, would yield such a return as would show that the rateable value of the premises was £3363 per annum, and if that average were increased to 58 retorts the rateable value would be £4334.

The following evidence was then called:—

Mr. *John Prest*, examined by Mr. Shaw.

I was assistant overseer of Wakefield at the time when this rate was made in June last. It was made and published in the form prescribed by law.

Cross-examined by Mr. Maule: Up to the present time the rate made last June is not all collected. I should think that about £850 is still outstanding. The whole township rate is £3900. It is now in course of collection. It is usually about six months before a rate is collected. We take out summonses to compel payment after a reasonable time. The last rate was laid on the 25th of June. I ceased to be assistant-overseer of Wakefield on the 25th of this month.

Re-examined by Mr. Shaw: The collection of a rate usually extends from six to eight months. The arrears are usually very great. Of the £800 of the last rate yet uncollected, £160 was due from the Wakefield Gaslight Company when I left office.

By the Arbitrator: There was no rate made in January last. Of the rate laid in October, 1857, there is about £50 yet uncollected. That arrear is principally owing by poor people. The next rate to that was the one made in June, 1858.

Mr. *Henry Clarkson*, examined by Mr. Shaw.

I am an engineer, surveyor, and valuer. I surveyed the works of the Wakefield Gaslight Company before the rate was made. I was appointed, in company with Mr. Lees Hammerton, to value certain properties in this township for the purpose of a rate. That was in May last. I made an application to inspect the company's works, books, and accounts. On that occasion I saw Mr. Statter, the chairman. I afterwards inspected the company's premises, and produce some notes taken at the time. The entire plant is in the township of Wakefield, and consists of a governor-house, one new gasholder, containing 400,000 cubic feet; another, known as "the Doctor" gasholder, containing 50,000 cubic feet; a third, known as "the Ben" gasholder, containing about 30,000 cubic feet. There are also two small gasholders, which were erected in 1822, but they have not been in use for two or three years. There are likewise a smith's and tinner's workshop, a manager's office, a station meter-house, extensive retort-house, purifying and lime sheds, open sheds, engine-house and chimney. There are no other buildings upon the premises. We found upon the first inspection on the 7th of June, 88 retorts, all set; one steam-engine, with small boiler attached, and all the other apparatus for the manufacture of gas. I have measured the mains belonging to the company. I find that in 1847 there were in the township of Wakefield 23,096 yards of mains; 612 in Alverthorpe-with-Thornes; and 727 in Stanley-cum-Wrenthorpe. In 1858 these had increased in Wakefield to 27,780; in Alverthorpe to 10,592; in Stanley to 1443; and in Sandal to 2809—giving a total of 42,624 yards, against a total of 24,435 in 1847. I think that when the rate was laid, a tenant would give for the company's works, as they then stood, a yearly rent of £3300; but if he could have it for a term of fourteen years, my opinion is he would give £3500. I think he would make an annual profit, if he took it at the first valuation, of £900; if he took it at the second estimate he would make a proportionable difference—£1100. I say this because I should anticipate an increased consumption of gas during a term of fourteen years. I think a tenant would make £900 profit upon the state of things as they were at the time the rate was laid, and assuming that no increase in the mains of the company was to take place.

Cross-examined by Mr. Maule: I make out that a tenant could give a rental of £3300. I made a calculation as to the income, and visited the works in winter and in the autumn. I took an average of 45 retorts being constantly in use, which gives me a consumption of 5000 tons of coal, equal to 45,000,000 cubic feet of gas. From this I deduct for leakage, and consumption of coal and gas upon the premises, 9,000,000 cubic feet, leaving for sale 36,000,000 cubic feet, which, at 4s. per 1000 feet, yields an income of £7200; gas tar will give £230; spent clay, £50; old materials and sundries, £191; liquor, £163; coke (from 5000 tons of coal), 3334 tons, at 7s. 6d. a ton, £1250; giving a gross income of £9084. This is upon the average of the 45 retorts; but if you take the average of 58 retorts of the total number set, and assume that 68 are in use in the winter, the gross income will then be £11,710, calculated on the same heads. The expenditure I estimate as follows:—For coals, 5000 tons, at 5s. a ton, £1250; clay and lime, £187; salaries and wages, including secretary, bookkeeper, gas engineer, men employed in the manufacture of gas, lamplighters, and meter-man, £1051; rates and taxes on £2845 (the sum at which the assessment is made), at 5s. 8d. in the pound, £806; office expenses, £100; bad debts, £56; wear and tear in retorts, brick-work, &c., £750—giving a total expenditure of £4200. Deducting this from the gross income, it leaves a balance of £4884 as the gross estimated value. I then make the statutable deductions, which are these:—Insurance, £15; interest on £2000 floating capital to carry on works, at £5 per cent., £100; renewal-fund on buildings, £4000, at 25s. per cent., £50; gasholders, £9000; purifiers, £500; condensers, engine, governors, and exhauster, £900, taken altogether at 10s. per cent., amount to £52; upon the mains, £18,000 at £1. 5s. per cent., £225—total, £442. There is a further deduction for tenant's profit, at 12½ per cent., on the £4884, the net returns of which are £555, and which, with the statutable deductions, leaves a total rateable value, including out-townships, of £3887. From that deduct £220—the value of the plant in Wakefield—and one-seventh, as the value of the entire mains in the out-townships, which leaves £3143. This was calculated from a statement made me by the chairman of the company, and from other calculations. I am not aware that only 8000 cubic feet of gas can be obtained from a ton of coal. My calculation supposes that 9000 cubic feet are produced per ton. My knowledge of the amount of gas is from observations of others. I myself have paid 4s. per 1000 cubic feet. Since the 1st of January last it has been reduced to 3s. 9d. This makes a difference of £450 per annum.

The Arbitrator: Do you suppose, in making your calculations, that a tenant would give 4s. per 1000 cubic feet when he received only 3s. 9d.?

Witness: No.

The ARBITRATOR: You have proceeded upon erroneous calculations.

Cross-examination continued: The items for gas tar and clay were taken from last year's receipts, and were furnished me by Mr. Statter. Mr. Statter furnished me with a summary of expenditure. When I could not obtain better information, I adopted his returns. I do not know that the company pays anything for royalty. I arrived at the estimate of £187 for lime and clay from my own calculation. It would cost about a pennyworth of lime and clay together to purify 1000 cubic feet of gas. I do not know the quantity which could be bought for a penny. I think the price allowed here is ample to cover the estimate. I made no calculation as to the quantity of lime, nor was I aware of the kind of lime used in purifying the gas. I have no personal experience as to the manufacture of gas. The expenditure for fuel used to convert coal into gas is included in the estimate given above. We considered that 20 per cent. would be ample to cover leakage and for heating retorts, and for gas consumed upon the premises. I have made no separate calculation as to the amount of fuel consumed in making gas. In the waste I include what is used for heating retorts. I cannot state what is used for heating retorts during the year. In the item of wages, I did not adopt the sum given me by Mr. Statter. I estimate the salaries of the secretary at £150; bookkeeper, £100; gas-man, £80; men employed on the works, £416; eight lamplighters, 12s. weekly each, £240; and the meter-man, £65—making a total of £1051. I have no knowledge of the number of meters in use, nor do I know how many the meter-man can attend to. I think he may examine twelve or fifteen meters an hour. I estimate that from the time he is in my own house. I estimate the item of £806 for taxes on the ground that the total rates in the town were 5s. 8d. in the pound. The per centage for bad debts is about one-half per cent. I have not examined the books to arrive at that calculation. I went to examine the books, but was refused permission to do so. [The witness further stated that he had not been able to make certain calculations which it would be necessary for him to produce, and, with the permission of the arbitrator, he retired to make them.]

Mr. *Thomas Newsome*, examined by Mr. SHAW.

I reside at Leeds, and am a surveyor and valuer. I have been in business for more than twenty years. I inspected the works of the appellants previous to the last quarter sessions. I was again over the premises yesterday. I have examined the whole of the premises.

The ARBITRATOR read his notes of Mr. Clarkson's evidence.

Witness: I agree with Mr. Clarkson as to his general description of the premises, but I differ from him in his estimate of the third gasholder, which I am of opinion is capable of containing 24,000 cubic feet. In my judgment, the works are worth £3000 for one year, and I should be willing to rent them at that sum, paying a half year in advance. I think I could realize £1000 a year from them. If I was a tenant for a longer term, I should give more per annum, and gain an annual increase.

Cross-examined by Mr. MAULE: On the first occasion on which I examined the premises I was between one and two hours there. I was in company with Mr. Clarkson, Mr. Hammerton, and Mr. Hall. The persons about the works were with us. I was yesterday in the works for about half an hour. I consider that that was a sufficient time to enable me to get a minute knowledge of the whole. I went thoroughly through it so as to satisfy myself. No objection was made to me going through the works. In paying a rental of £3000 I should save in expenditure. I should reckon only £900 for wages, as I should be my own secretary, which would save £150. I should also be my own manager. The cost of coals I should estimate at £1250, and for clay and lime, £187. 10s. I should put down £750 for wear and tear. I should estimate taxes at £850, being 5s. 8d. per pound on £2845; for stationery and other expenses, £100; bad debts, £55. 10s.—total, £4244. I assume £9084 as the gross receipts, and make it up in the same way as Mr. Clarkson does. I do not know the number of meters, but I have allowed one man's time to examine them. My estimate of the renewal-fund is the same as Mr. Clarkson's in gross, but not in detail. I allow for renewal £325 per annum, which will reproduce the whole in forty years. The rateable value of the buildings is £220, and is estimated in this way:—Governor and valve-house, £3; smith's and tinner's shop, £2. 18s.; manager's office and weigh-house, £2. 4s.; meter-house, £4. 17s. 6d.; retort-house, £74. 6s.; sheds, £11. 6s. 8d.; passage and boiler-house, £1. 10s.; smith's shop, £3. 1s.; glazier's shop, £3. 4s.; engine-house, &c., £2. 0s. 6d.; old meter-house, £1. 2s.; open shed, 8s. 6d.; engine, £14. 8s.—making together, £125. 16s. Add to these—gasholders, £125; lands and chimneys, £13. 5s.—gives a total rateable value of £264; and, deducting one-sixth (£44), we have a net value of £220. Each building is measured, and its size worked out per yard. The retort-house is taken at 2s. per yard, and the gasholders are reckoned at fifteen years' purchase on £9000, in which sum is included everything connected with them.

Re-examined by Mr. SHAW: It is often necessary to examine meters four times a year. In my judgment, one bookkeeper would be sufficient to enter the business of the meter-man. It is customary to charge 10 per cent. for the use of meters, but I have not included that item in my estimate. My estimate of £3000 a year is only framed upon a partial occupation of the works. If the company were to produce gas with their 88 retorts during the winter, which is equal to an average of 58 during the year, I would undertake to give them £4200. With regard to wages, I could afford to give the secretary £150, the bookkeeper £100, the gas engineer £80, eight men employed in the works all the year round, and give them 20s. a week each, which amounts to £416; eight lamplighters, £30 for the year, which is close upon 12s. a week; and the other officials the same as Mr. Clarkson's estimate.

By Mr. MAULE: I have had no personal experience whatever in making gas.

By Mr. SHAW: I have valued gas-works before. I valued the Leeds gas-works for an appeal in 1833, on behalf of the overseers, and my estimate was supported.

By the ARBITRATOR: I made my estimate by estimating the price of gas at 4s. per 1000 cubic feet.

Mr. *Clarkson* recalled, and further cross-examined by Mr. MAULE.

I consider that an estimate at thirty years' purchase of the gas-works would be high. I value the gasholder at £9000; that includes the brick-work, the stone, the excavations, the building up, but not the iron. The estimate of £500 for the purifier is Mr. Statter's valuation. The £900 for condensers and exhausters I also got from Mr. Statter. The small gasholders were put down in 1822, and the use of them was discontinued a few years ago. We examined them, but put no value upon them. I examined the "Ben" gasholder. It was full of gas. I did not observe a hole in it. There are 15 miles 1380 yards of mains in Wakefield, or 27,720 yards. In giving an estimate of a profit of £900 being obtained, I assume that the tenant would himself discharge the duties of secretary, and thereby save £150. He need not put by so much for the renewal-fund, and would also save one half of the interest on the floating capital (£50). These savings would go to make up the £900 profit. I do not put the 12½ per cent. upon the amount of the gross receipts, because it is unusual to do so. I have valued for other townships.

Re-examined by Mr. SHAW: A tenant cannot earn his gross receipts without certain deductions for repairs, &c., and I therefore consider that the fairest way would be to calculate upon the net produce. If a trader gets a profit of 10 per cent., he has an ample return. I know some persons who think themselves well off if they get a profit of 5 per cent. In the out-townships the supply of gas is very small, although the mains are of considerable length. There is a main laid down to Thornes House and another to Lupset Hall. To the latter place the length of main is 1177 yards, and only a portion of the hall is lighted with gas. The length of mains to Sandal, beyond the place where the mains for the supply of public lights terminate, is 2309 yards, and the supply is given only to a few houses. In Alverthorpe and Stanley, gas is supplied chiefly to small properties. Only one or two factories are lighted with gas.

Mr. *Joseph Hall*, examined by Mr. SHAW.

I reside at Huddersfield, and am a surveyor and valuer. I have had considerable experience in valuations during the last thirty-two years. On the 7th of October last I valued the Wakefield Gas Company's premises with Messrs. Clarkson, Hammerton, and Newsome, and from what I saw on that occasion I am of opinion that a tenant from year to year would give a rent of £3099. The value of the works would be enhanced to a tenant who had them for a term of years. I take 45 retorts as the average number in use throughout the year—68 are now in use, and 88 are set. There were 40 retorts in action on the 7th of October. The principal consumption of gas is from October to March. If the average of 45 retorts is taken, it shows that the consumption of coal would be 5000 tons per annum, which would produce 45,000,000 cubic feet of gas. I deduct for leakage, furnace coal used in making gas, and for consumption of gas on the premises, 20 per cent., or 9,000,000 cubic feet, leaving 36,000,000 for sale. The receipts of the company in that case would be—

36,000,000 feet of gas, at 3s. 9d.	£6750
3334 tons of coke, at 7s. 6d.	1250
Gas tar	230
Spent clay	50
Old materials and sundries	191
Liquor	163
	£8634

If 58 retorts were in use, the receipts would be £11,128. With regard to expenditure, I estimate it as follows:—

5000 tons of coals for retorts, at 4s. 10d.	£1208
Lime and clay	187
Wages and salaries	1051
Wear and tear	656
Rates and taxes (on £3000, at 5s. 8d.)	850
Office expenditure	100
Bad debts	67
	£4119

This would leave a gross rateable value of £4515, estimating the average number of retorts at 45, or of £5817 if the average were 58. From this sum of £4515

I deduct for—

Insurance of buildings (£4000, at 5s. per cent.)	£ 10	
Interest on £2000 floating capital, at 5 per cent.	100	
Renewal-fund account (1 per cent., which would replace the whole stock in forty years)	327	
Tenant's profits on floating capital, £2000, at 25 per cent.	500	
		937
		£3578
From this I deduct £220, and one-seventh on residue for pipes in the out-townships		479
Leaving the rateable value of property in thetownship		£3099

I consider that £2000 is an amply sufficient floating capital for carrying on the business of this gas-work, which differs from a railway company, where a large rolling-stock is required. I allow the secretary for salary £150, and the bookkeeper £100, and my estimate for wages is the same as Mr. Clarkson's. I consider the present number of men at the works is sufficient for the purposes of the company.

By the ARBITRATOR: In making my estimate, I have considered that I should have the supply of gas to the out-townships. The value of that portion of the plant required to produce the earnings in the out-townships is so small that it is not worth consideration, and even if I did take it into account I do not consider that it would make a difference of more than £30. I adopted Mr. Clarkson's figures as to the value of the buildings. I estimate the tenant's profits at £500, but I could make more than that amount on a rent of £3000. I might get a discount off the coals at 4s. 10d. I could also do the work of the secretary, and make a saving in other expenses. Whatever was so saved I should keep to myself.

Mr. *Lees Hammerton*, examined by Mr. SHAW.

I am an architect and surveyor, and was appointed by the overseers to value this property in Wakefield for the purpose of a poor-rate. I have been in business as a valuer for more than thirty years. In company with Mr. Clarkson I valued the Wakefield Gas-Works. Before entering upon the valuation we applied to the company to have an inspection of the books. That was in May. After two or three applications, we were shown a book containing in one page a summary of the accounts, but we were told that we should not be allowed to examine the books. We examined the works in October, and again on the 20th of this month, and our estimate is that they would let to a tenant from year to year at a rent of £3099. This is the same conclusion as that arrived at by Mr. Hall, and the results are attained by the same items. I was present at Mr. Hall's examination, and heard his evidence. I know what the rates are in Wakefield. The number of poor-rates in a year vary. I have known three in one year, and sometimes only one. They also vary in amount. The average of the poor-rates during the last six years, including 1857, is 2s. 8d.

By the ARBITRATOR: I think the trading capital is the most certain basis for calculating tenant's profits. Ten per cent. is sufficient in some trades—some would be satisfied with 5 per cent; but I think that is too little.

Mr. *Charles Lee*, examined by Mr. SHAW.

I am a surveyor, and reside in Golden Square, London. I have been in

business thirty years. During that time I have valued between 140 and 150 parishes and townships in and near London. I have had considerable experience in rating gas companies, and I have been employed by gas companies to defend them against excessive rating. On Monday last I went to inspect the gas company's works at Wakefield, and was denied admittance. I have heard the evidence of Mr. Clarkson, stating that the number of retorts set was 88, and that on the 20th of this month 68 retorts were in actual work. I should take an average for the whole year of 45. I think that a fair average. With 45 retorts the company would make 45,000,000 cubic feet in the course of the year. I make a deduction of 20 per cent. for leakage, which includes leakage, fuel for carbonizing, and gas used on the premises. That is a proper deduction. Taking the gas at 3s. 9d., it would produce £6750. To produce that amount of gas, 5000 tons of coal would be required, which, in its turn, would produce 3334 tons of coke. Assuming the price at 7s. 6d., it would produce £1250. Upon the amount to be obtained for gas tar, spent clay, liquor, and old materials, I can give no opinion, as the value of these depends upon locality. In some places gas tar is worthless, and cannot be sold. I am told there is a demand for it here. In London I should put down an item for "breeze," which is small coke, and can be sold there; but here, I suppose, it is of no value, as coal is cheap. Assuming the average number of retorts in use to be 58, an estimate of the quantity of gas would produce £11,128. The estimate for coal, 5000 tons, at 4s. 10d. per ton, is £1208. Lime and clay (a good tenacious clay is required for luting), which I reckon at 1d. per 1000 feet, I generally allow 0·90. Lime is about 4d. per bushel. That would make £187. I think that is liberal towards the company. I consider the amount paid to lamplighters is too large, as it is usual for corporations to pay that item; and the item of wages should therefore be reduced by £161, making £888. I think that eight lamplighters are more than enough for the work which they have to do. There are 560 lamps; 146 of these are in the out-townships. The other men employed on the premises are ample for the work; but in small gas-works the functions of secretary and bookkeeper are combined. The item for wear and tear is fair. It is taken upon the 68 retorts in use—not upon the 88. I have calculated rates and taxes upon £3,000, the rates being furnished me, £850. I consider £100 for office expenditure is ample. The item of bad debts is a matter of locality. In the statutable deduction there is an allowance for insurance, which is correct. With reference to the floating capital, I always estimate half a year's expenditure, whatever it may be. That is a rule with many valuers. If the company collected their rents at the end of the year, I should allow £4000. According to my experience, I consider that is a fair and reasonable principle. I have calculated for a renewal-fund on £32,700, at 1 per cent. Some of the original outlay of the London company has gone to the winds. I have not been inside and seen the buildings. The life of a building or a tank may be eighty or ninety years, but I think that forty years is a fair time to calculate for the renewal in this case. One per cent. upon £32,700 is £327. I allow £500 for tenant's profits, which is 25 per cent. upon the floating capital, because it is customary to do so. In railway companies, water companies, and gas companies, the profits are always calculated upon the floating capital. I would calculate upon the floating capital and nothing else; but should not use a fixed per centage. A fixed per centage on the returns would not be a correct mode. This gives, as proved by Mr. Hall, £3099, to which is to be added the money paid by the corporation for lamp lighting, £163. I reckon, therefore, that the annual value of the works is £3262, and a tenant would give that for a year—if for a term, he would give more. As the company can divide 10 per cent. per share upon a capital of £43,300 (without the money they have on loan), the annual rent a tenant would give would be £3700; 10 per cent. or £4330 is the sum which goes net into the owner's pocket. Under ordinary circumstances that would be the rateable value: but inasmuch as in this case the owner is also the occupier, you must deduct a tenant's profit:—and that being deducted, leaves the net profit for the company, £3700. I assume all outgoings are deducted before the dividend is paid.

By the ARBITRATOR: My allowance of £500 includes the labour of the tenant and the risk he would run. I consider that by doing away with the secretary's office, the addition would not be the tenant's profit, but merely a reward for labour. In selling businesses under railway compensations, we take a certain number of years' purchase, according to the nature of the business. Floating capital, in that case, becomes a deduction. The per centage for tenant's profits varies according to the size of the concern. I have no fixed per centage. In buying or selling a business, I should examine the books to ascertain the income. In gas companies I have allowed, on small concerns, 30 per cent. At Wandsworth I allowed that on £500 or £600 capital. In the Phœnix case, I allowed 12½ per cent. on a much larger capital. I always adopt the principle I have named for the renewal-fund; the per centage varies with the state of the buildings. In this case, I take the state from Mr. Hall, and I allow 3d. to 3½d. per 1000 feet for wear and tear. Extensions should always be made out of capital and renewals out of revenue.

Mr. *Henry Morgan*, examined by Mr. SHAW.

I am clerk in the town-clerk's office. I produce an agreement between the corporation of Wakefield and the gas company; it is for lighting the public lamps for one year. There are 434 lights in the township of Wakefield, and 146 out of the township, for which the corporation contract. For lighting, cleansing, and extinguishing 434 lamps, the corporation pay 7s. 6d. each. The corporation paid to the gas company in 1857 £1314. 16s. 9d. The gas-rent is due half-yearly, and if the corporation do not pay, they are liable to be charged interest from the day the payment should be made. The penalties incurred have been set off against interest.

Mr. *Ralph Linfield*, examined by Mr. SHAW.

I am one of the overseers of Wakefield, and am the owner of shares in the Wakefield Gas Company. I received 5 per cent. for the last half year, and the same for the previous half year, as dividend upon my shares.

By the ARBITRATOR: There was a new valuation made between May and June. It was made by Mr. Clarkson and Mr. Hammerton, by order of the guardians. The assessment of the company was considerably higher than the last, which was about £1200 or £1300. Several other properties as well as the company's were valued. I attend the half-yearly meetings of the company.

Mr. Alderman *Ash*, examined by Mr. SHAW.

I am a corn merchant in Wakefield, and one of the overseers. I am trustee for Mrs. Westmoreland, under a marriage settlement, of shares in the company. I have received a 10 per cent. dividend upon an average since 1855. It is payable half-yearly.

The contract with the corporation and the Wakefield Gas Act, 1856, was put in.

Mr. *Hall* recalled, and cross-examined by Mr. MAULE.

I have never been concerned in the actual management of gas-works, and have no knowledge of the daily details of such concerns. I consider that the accounts should be collected quarterly. On this concern I could make more than £500 a year, after paying a rent of £3000, but should not come up to Mr. Clarkson's estimate of £900. My calculation is based upon being able to obtain 9000 feet of gas per ton of coal. I estimate the leakage at 12½ per cent. on that yield, I allow 3 per cent. for coals, and 4½ per cent. for gas used on the premises; or, in money—for leakage, £1054; for fuel, £253; and for gas used on the premises, £380. This gives 12½ per cent. for leakage of gas on 45,000,000 feet made. I cannot tell how much coal and coke are required for fuel, nor have I any knowledge of the quantity of coke produced. A bushel of lime will purify the gas obtained from one ton of coals. Derbyshire lime is 10s. per ton at Huddersfield. My estimate is made at 10s. 8d. at Wakefield. I adopt Mr. Newsome's figures as to insurance on such parts of the works as are insurable. Two hours' examination of the company's works sufficed to take the details for my valuation.

By the ARBITRATOR: I took the quantity of gas tar from a statement made to me by Mr. Clarkson. I give as my own the quantity of coal used, the coke made, the rates, &c. I should allow 15 per cent. if the floating capital was £5000; 12½ per cent. is my minimum, even for a large concern, and my maximum would be 30 per cent.

Mr. *Lees Hammerton* recalled, and cross-examined by Mr. MAULE.

In 1854 I went over these works, but did not complete the valuation. The overseers fixed the rate at that time at £1200. The new gasholder was not then completed. In 1858 I valued the gas-works and other property in the town. Several of the valuations I then made were appealed against, and have been reduced by agreement. The total amount in the pound paid for parochial rates in 1858 was 6s. 4d. I made no independent valuation on the 7th of October from Messrs. Clarkson and Newsome. I was at the gas-works for some hours. I adopted the 9,000,000 feet for leakage from Mr. Hall's calculation. I do not know whether I have the valuation upon which the rate of £2845 was made, nor can I give any details of my valuation, which was more than £3000. They perhaps went as waste paper. I have had no experience in the production of gas. I made inquiries as to the staff employed, and I believe my estimate in this respect is sufficient.

Mr. *Lee* recalled: Some of my figures were obtained from Mr. Clarkson. The £2000 for floating capital is my own. I believe that the allowance of 20 per cent. for leakage, fuel, and gas consumed on the premises, originated with me. I calculate 1000 tons of coal to carbonize 5000 tons. I know nothing about Wakefield coals as to either the quality or the quantity of gas they will yield. I allow 6½ per cent. of the 9,000,000 for leakage, 15 per cent. as representing the value of the coals used as fuel, and 22½ per cent. for gas burned on the premises.

By the ARBITRATOR: If a tenant found 20 per cent. leakage, he would be entitled to a reduction of £520 in the rent. If the yield of gas was only 8060 feet per ton, instead of 9000 feet, the rent would be £750 less on that score.

Mr. *Morgan* was recalled, and gave in a statement of the rates paid from 1853 to 1858.

Mr. *Clarkson* was recalled, and in answer to questions by the arbitrator said: My calculation of one-seventh as the proportion due to the out-townships was taken upon the balance of income over expenditure. It is the result of my own calculation, and it assimilated with the statement made to me by the chairman, who told me that the earnings in the out-townships were one-seventh.

Mr. *Lee* asked leave to explain a part of his evidence. The estimate of 20 per cent. was taken upon the 45,000,000 cubic feet; so also was the 12½, the 3, and the 4½ per cent. The 6½ per cent. was upon the 9,000,000 cubic feet, and not upon the 45,000,000.

This was the case for the respondents.

After some conversation, it was agreed between the solicitors on both sides that the interpretation of the submission to reference should be to give the arbitrator full power over costs of appeal at session and of reference.

Mr. MAULE then opened the case for the appellants. After remarking upon Mr. Shaw's statement in opening the case for the respondents, he proceeded to a narration of the facts afterwards proved by the appellants' witnesses. He stated that the whole of the capital expended by the company was between £40,000 and £50,000, although power was given them under their Act to raise £79,000. The works, therefore, must not be measured by the larger, but by the lesser amount. The company had from time to time extended their works, but the assessments made by the overseers had increased much more rapidly than the works had been enlarged. From the year 1823 to 1850 the rateable value of the premises had been taken at £644. In the latter year it was raised to £1078; in 1854 it was increased to £1270; and in 1858 it had been assessed at £2845. In reference to the observations which had been made on the other side, he remarked that Messrs. Clarkson and Hammerton had had full access to the books and premises of the company, and that the chairman gave them a tabular statement showing the income and expenditure of the company.

The following evidence was then taken:—

Mr. *William Wilson*, examined by Mr. MAULE.

I am a gas engineer, residing at Castleford. I have had large practical experience, having been in business about twenty-five years. I have been engaged in erecting gas-works both as engineer and contractor. I was employed by the Wakefield Gas Company with Mr. Tolson White in August last to value the whole of their works and mains. It took us two days measuring, and three days squaring up. If we had taken only two hours we could not have made a reliable valuation. We could not have measured the large tank and valve well in two hours. I got the measurement of the mains from the company's books.

Mr. SHAW objected that this was not evidence; whereupon

Mr. *Clarkson* was recalled. He stated that the mode in which he obtained his evidence of the mains was as follows:—The secretary of the company gave me an account of all the streets where mains were laid, fixing the points of commencement and termination, which I afterwards measured in the plan of the borough. I produce a plan of the borough published by Mr. White. In the statement given to me by the secretary, one line of mains only was mentioned as being laid in Northgate, Kirkgate, Westgate, and the works; it now appears that two lines are laid in these streets, which may account for the difference.

Mr. *Wilson's* examination continued: Valuation. I have had several contracts lately for laying mains, and I have valued these mains at the same price. I cannot account for the difference between my valuation of them and Mr. Clarkson's. I have taken the quantity of meters from the company's books. There are 1873 in all, and their value is £3187. 18s. The buildings, tanks, sheds, &c., I value at £6837. 4s. 6d., and the sundries, consisting of the governor and connexions, gasholder inlet and outlet valves, gasholders, station-meter, sundries in manager's office and tinner's shop, retorts and fittings, working tools, engine, boiler, and exhauster, condensers, shed, car wheels, crab and wood centres, purifiers, &c., at £8097. 1s. 10d. The

average price of coal in Wakefield is about 5s. per ton. I know the quality of that coal, and that with care and attention 8000 feet of gas per ton might be produced. I have practically tested the quality of the coal, and as the result I have not felt myself justified in quoting the yield of gas at more than 7000 cubic feet of gas per ton. There is no coal in this neighbourhood which will yield 9000 cubic feet on an average; practically I could not calculate upon more than 8000 feet, and that would be with great care and attention in the manufacture. I have made experiments for the purpose of ascertaining the quantity of coke which a ton of this coal will produce. There is no coal in the neighbourhood which will yield more than 12 cwt., or 12¼ cwt. of coke per ton. I always calculate that it takes 30 tons of fuel to carbonize 100 tons of coal; or if coke is used entirely, say 25 per cent. A thousand tons of coal would be insufficient to convert 5000 tons of coal into gas.

Cross-examined by Mr. SHAW: I made some elaborate experiments in these matters in 1847, but my evidence to-day is not altogether based upon those experiments. I find some alterations in my experiments at the present time; I find more gas now than in 1847. I do not get more coke now. I do not know what the quantities were in 1847. On the occasion of my examination before the surveying officers, I gave answers as reported to questions 1953 and 4: but that evidence was given on Silkstone coal, and I am now speaking of Wakefield coal. My last experiments were made two months ago, at Pontefract. The coal was from Balne Lane; it came to the gas company at Pontefract, and I was employed to test its quality. I don't know who sent it. Prior to that experiment I had not made one during the two preceding years. I do not know that Balne Lane coal contains a large quantity of lime. I have not tested the coal used by the Wakefield Gas Company since 1847, and I was not asked by Mr. Lumb to give my opinion upon that subject until yesterday. I know the company do use Burnley's coal, and I believe they used the same kind in 1847. I do not know whether it was from the same pit. Burnley has pits at Methley, but I do not assume that coal would be brought from Methley to Wakefield. I may say in explanation that, in 1847, when I went to the pit and got coal, and tested it, I did not get 12 cwt. of coke from a ton. I do not know the price of the Balne Hill coal, nor did I know that the Wakefield Gas Company paid only 4s. 9d. per ton for the coal they used. I asked Mr. White, and understood from him that the price was about 5s. To a private consumer, I dare say, coal of a similar quality would be charged about 6d. per ton more. The fuel coal is about 4s. per ton. Leakage arises from defects in pipes, and through condensation. I gave evidence in 1847 that for new works the leakage was 10 per cent. From my experience since that time, I am led to think that that per centage is too low for new works. I think 12 per cent. is nearer the mark. I did not dig down to the mains, to examine them before making my valuation. I should be surprised to find that Mr. Statter had valued the mains at £18,000; but there is many a clever man who, though chairman of a gas company, does not know anything of the value of the works.

Re-examined by Mr. MAULE: I am satisfied with the experiments that I made in 1847, so far as Wakefield coal is concerned, and the experiments I made two years ago confirmed me in my opinion. That was from the Whitwood Bed. After works have been in use for thirty years, I should think 20 per cent. a fair allowance for leakage. This refers to leakage only—to the loss of gas. I have put down mains at £7645. 12s. 10d., on the assumption that they were new. A proportion of the pipes have been laid down since 1847. I do not know that the company gave their estimate of leakage at that time as 10 per cent. I do not know whether they had a station-meter then. I should say that Burnley's coal and Balne Hill coal would produce a similar quantity of gas. I do not know from what bed Burnley supplies his coal; I judge from seeing the coals in the company's yard. They appear the same as the Whitwood top bed. The Whitwood and the Stanley Main are different coal. I do not think the Stanley Main would produce more gas, nor do I know whether it is a coal that is much prized in London. I tried that coal in 1857, but I should not think it would produce more than 8000 feet of gas per ton. The Balne Hill coal is not the fuel coal.

By the ARBITRATOR: The life of retorts, on an average, is from twelve to eighteen months.

Mr. *Marriott Ogle Tarbotton*, examined by Mr. MAULE.

I am a surveyor and engineer, and was formerly in business with Mr. C. Clapham. My experience in Wakefield extends over seven or eight years. I have had to break up the streets, where the company's mains lie, and I know the extent of those mains, having measured the length of those in the township with Mr. T. White. The length of mains in the township is 17 miles and 95 yards, or 30,015 yards; and in the out-townships the length is 17,973 yards. I am the surveyor of the borough, and am constantly breaking up the streets, so that I cannot avoid disturbing, altering, and sometimes breaking the gas-pipes. The consequence is, a large quantity of leakage ensues, particularly if an accident of that kind happens during the night.

Cross-examined by Mr. SHAW: I have been present when accidents have happened in the night. I was present in Thornhill Street once after eleven o'clock at night, when a small main in a sewerage trench was broken, and we had to send to the gas company. The accident was speedily repaired. Sometimes when a breakage occurs it takes a day to find out the place, and accidents are constantly occurring from settlement of soft ground. I have known a subsidence of earth take place six months after I have filled up a trench. I presume the Local Board of Health would have to pay for any damages thus occasioned, but I do not remember any claim having been made. The company have been taking up old pipes, and laying down new ones of larger dimensions. I believe, also, they have extended their mains. In Westgate and Kirkgate they have enlarged the diameter, but not increased the length of the mains. Assuming the pipes are properly laid, the leakage would be less with new pipes than with old ones.

Re-examined by Mr. MAULE: I have very often observed that the earth packed round the gas-pipes is of a colour which indicates that there have been escapes of gas. I have occasionally discovered such escapes. A week ago I found that one of the mains had snapped just over the manhole of a sewer, so that the sewer was filled with gas, and the men could not go into it. When the pipes have been broken by the local board, they have had to make good the damage; but they have never had to pay for the gas which has escaped through leakage. When an accident occurs to a gas-main, there is no indication upon the surface as there is with a breakage of water-pipes. The length of the company's mains in Kirkgate is 600 yards, and in Westgate 200 yards.

The proceedings were resumed on January the 11th at the King's Arms Hotel, Palace Yard, Westminster.

Mr. *Wm. Wilson* recalled, and examined by Mr. MAULE.

Two years ago I made some experiments to ascertain the yield of gas per ton of Burnley deep coals. Since I gave my evidence on the last occasion, I have experimented on the coal used by the Wakefield Gas Company, in order to ascertain the yield of coke per ton. It is the Burnley scale coal generally which is used by them, but there is also a small quantity of Burnley deep coal. The yield of coke per ton from these two coals together is about 11¾ cwt. I calculate that about 8 cwt. per ton, or nearly 40 per cent. of fuel, would be used to produce that quantity of coke—*i. e.*, for every ton of coals put into the retorts, 8 cwt. of coal was required to be put into the fire in order to carbonize it. The coke I took was out of 15 of the 45 retorts in use. They were sound retorts. If they were not sound there would of course be a loss of gas. The experiment of carbonizing with coke showed that 6 cwt. would be required to carbonize one ton of coals, which is about 30 per cent. I have here a calculation based upon the quantity of coal used at these works per annum. Assuming that 3580 tons of coals were used for the distillation of gas, exclusive of that required for fuel for the furnaces, and taking 12 cwt. of coke per ton of coals, it would produce 3348 tons of coke per annum. In 1857 the company sold 2531 tons.

The ARBITRATOR: Of course this is taken *de bene esse*.

Witness: They had, therefore, 817 tons unsold, and assuming that they bought 1002 tons of fuel coal in that year, they would require 772 tons of coke as fuel to make up the calculation. The difference between the 772 tons required for fuel and the 817 tons left unsold would be waste, and not brought into account. I have estimated the cost of repairing the mains in the township of Wakefield, which were the basis of my valuation. I should say it would be about £2 per mile per year.

By the ARBITRATOR: I made the length of mains to be 17 miles.

By Mr. MAULE: In that £2 per mile I include any breakages which may take place in the mains. The term of life I give to a gasholder and condenser is thirty years, and to purifiers fifteen years. There are, however, some wrought-iron purifiers at Wakefield now which have only been in use ten years and are worn out. Wrought iron decays faster, but assuming them to be of cast iron, I should say they would last fifteen years. To a station-meter which registers the gas manufactured, I should give a life of fifteen years, and to main pipes a life of fifty years. Fifteen years is quite enough to reckon for service-pipes. I know the brick retorts which were lately built on these works, and have noticed them more particularly since I made these experiments. There are several of them with the bottoms out, *i.e.*, they have given way so as to let the gas escape.

Cross-examined by Mr. SHAW: I made the experiments I refer to on the 31st of December and the 3rd of January last, at the Wakefield Gas-Works. I saw the coal brought into the yard, and I also saw the bill of the man who brought it. There was coal in the gas-yard, but it was not weighed, and it had been supplied by another man; so I got the kind of coal used in 1857. The company must have used coke for the purpose of carbonizing, but they only did so partially—*i. e.*, 772 tons of coke to 1002 tons of coal. The company have not got a very ready market for their coke; if they had there would not be such a stock on hand, considering that this is now the malting season. They had a great deal more on hand last August than they have now. I think, taking one year with another, the average cost of repairing mains would be £2 per mile per annum. I spoke of the brick retorts being erected in 1857 from information which I received. I was not there in that year. The company cannot tell from their books the quantity of coke which they produce, but only the quantity which they sell. They very likely take stock once a year or half year, but in doing so they only assume the quantity of coke, and do not weigh it over. The number of bushels of coke per ton of coal will vary a great deal, according to the quality of the coal. I have never measured the coke at Wakefield, but only weighed it.

By Mr. MAULE: The reason why I took Burnley's coal in making my experiments was, that I found it was the coal used by the company in 1857. There was but little coal in the gas-yard besides what I used. It was shot out of the carts in heaps, and I could not have weighed it without refilling it, as the only weighing machine is the one on which they drive the carts. The 6 cwt. of coke which I gave as the quantity consumed for fuel is founded upon the assumed quantity of coke left after the sales of the whole year.

By the ARBITRATOR: There is very little difference in the kind of coal which was on the company's premises. It is got from another proprietor, but within a very little distance of the same place. I do not know whether it would produce more gas. I should think not.

Mr. *Joseph Tolson White*, examined by Mr. MAULE.

I am a surveyor, residing at Wakefield, and have been engaged in surveying and valuing between twelve and thirteen years. I produce a plan of the Wakefield Gas-Works, which I was employed by the company to make. I have also made a valuation of the land, and of the buildings upon the company's premises. I made that valuation in company with Mr. Wilson. It occupied us between two and three days making the measurements, and two or three days in casting them up. We could not have come to anything like so satisfactory a conclusion if we had only employed two or three hours upon the calculations. I have heard all the details which Mr. Wilson gave, and I concur in them from beginning to end. In fact, they are the result of a concurrent valuation made by us. Besides the valuation which we made of the buildings and mains, I have also made a valuation of the land. The unoccupied portion, which in my calculation I call waste land, because it is unproductive, is 5029 yards. I value the whole site of the gas-works at 2s. per square yard, and the total quantity of land, both occupied and unoccupied, I estimate to be 15,068 yards. There are some lands shown in my plan which, though forming parts of the company's premises, are separately rated, and form no part of the property under discussion, because no question has been raised about them. [Witness pointed out the lands referred to in the plan.] The reason why I have assumed 2s. per square yard to be a proper value for the whole of the land, is that I think it would be a good site for the company to purchase if they were about to build works.

By the ARBITRATOR: The total value I bring out at £1506. 16s.

By Mr. MAULE: That I take as the value of the property in addition to the value in which I concur with Mr. Wilson. I have here a plan of the borough of Wakefield which I have made, and, from a comparison of that plan, I am able to give the position and length of the company's mains. The sum total of those mains in the township of Wakefield amounts in length to 17 miles and 95 yards. I state this of my individual knowledge, and not from information borrowed of any one else. The length, taken in yards, is 30,015 yards. I am a colliery viewer as well as a surveyor, and I am acquainted with the character of the coal in the district of Wakefield. I have not been at the Balne Lane Pit, and do not know the coal produced there. I know the Stanley Bed. I do not know the Woodhead Bed. Mr. Wilson spoke of the scale coal, and there is another coal above that. It is not an upper stratum of the same bed; there are 30 yards between them. These are the coals which Mr. Burnley had. I know the Whitwood coal; it is different from the Stanley Main.

Mr. MAULE: From your knowledge of the Whitwood top coal, and the Stanley Main, and the Scale coal, can you tell us what the difference is?

The ARBITRATOR: Do you know the Scale coal?

Witness: Yes. They are working the Heighmoor coal now.

Mr. MAULE: That is a higher stratum?

Witness: No; the Heighmoor is the lowest.

Mr. MAULE: You know these three beds; which is the best for gas purposes? For distilling gas from, which yields the most gas per ton?

Witness: I cannot speak to that. I cannot tell anything about the Balne Lane Pit. I know, speaking generally, these are the same beds, but I cannot personally identify them. At St. John's they work the Stanley Main coal and the Scale coal. The Heighmoor is not worked near the town of Wakefield at all by Mr. Burnley. The pit at St. John's is Mr. Burnley's. I know the pit close to the gas-works. That is Mr. Burnley's. The coal worked there is the Scale coal; I think the pit has not gone down deep. I do not know the merits of those two pits, contrasted one with another, as regards the quality of the coal for making gas. I know that, as fuel coal, the Scale is best for house fires, and the Stanley Main for steam purposes. They are frequently mixed for household purposes. The stratum of the Scale coal is about three feet in thickness. There is very seldom any difference in the kind of coal found in that thickness. It is all worked together. I have been engaged in making valuations of property for the purpose of sale in the township of Wakefield ever since I was in business there—that is, for the last twelve years, and previously, indeed, to that. It depends upon the nature of the building which is intended for sale what per centage is put upon it. The age of the building is also an element in the calculation, of course. Speaking of buildings like those of the Wakefield Gas Company, I should give 7½ per cent. for the investor's money.

By the ARBITRATOR: That is the return he ought to look for. They are more subject to have houses empty in Wakefield than many places.

By Mr. MAULE: I should make the same allowance for all the other property in Wakefield of a similar character—that is, for business purposes. Buildings in Wakefield are selling to realize that. After the ordinary landlord's deductions are made, it leaves about 5 per cent.

By the ARBITRATOR: If I purchased the buildings in fee, I should expect a return in the shape of rent of 7½ per cent., irrespective of the cost of construction.

By Mr. MAULE: I reckon that 2½ per cent. would cover renewal and insurance, and leave the landlord 5 per cent. in his pocket. From my knowledge of the township, I reckon that 5s. 10d. per square yard is the value of the land occupied by the company's mains. That calculation is arrived at by taking the length of each street and the price per yard of frontage property, adding the amount to a total, and dividing it by the entire length of the mains. The value of house property in Wakefield varies very much, probably from 1 to 5 per cent. I should think there are some houses in the town which do not realize 1 per cent. upon the cost price, and warehouses less than that. I have heard Mr. Wilson's calculation of the value of the pipes of the company in the out-townships. I have gone through his calculations and checked them, and I agree with him as to the result, as also with regard to the "sundries" in the township.

Cross-examined by Mr. SHAW: I do not know that the Wakefield Gas Company make any difference of charge to the tenant whether the landlord's property yields 1 or 5 per cent. I think it would be only fair that they should charge a uniform price to all consumers in dwelling-houses. I do not think any man could make the survey and calculation of the value of the company's premises in less than from three to four days, taking the details as we did. Of course a great deal depends upon the facility and skill of the valuers. I think he would be a very skilful valuer who could value that place under two hours. If the land belonging to the gas company were put up for sale, I do not think it would fetch more than 2s. per square yard. I do not call it a central situation. It is near the new borough market, where land does not sell well. I do not know that for a gas company a better situation could not be found in the township of Wakefield. I was concerned in the sale of some land to the company when they were talking of moving their works, because this was not a good locality. I sold some land near the borough market recently at 3s. per yard. It was a small plot of front land, situated between the borough market and the gas-works—about 400 yards, suitable for manufacturing purposes. The distance between the borough market-house and the gas-works is about 420 feet, and I have sold front land within that distance at 3s. a foot. I have been agent for property in that neighbourhood for the last four or five years, and I have sold no land for more than that price. At the time the borough market was a new scheme, and expected to be very profitable, land did fetch a higher price—I believe as much as 10s.—to people who were speculative, and inclined to build shops; but it has turned out to be an unprofitable scheme, and now the land is scarcely saleable at all. I am not aware that the borough market committee are asking 14s. 6d. per square yard for it. I will sell land quite as good as any they have to dispose of at 3s. The gas company's works are in the same street in which I have recently sold land at that price. I have had no experience at all in experiments upon coals for the purpose of producing gas. I know the geological position of the Balne Lane Pit—it is the same as the other. It did not occur to me to go to that pit—I have been too much engaged to go. At St. John's Pit they are working the Scale coal and the Stanley Main too at the present time. I was down that pit before it was sunk; I was in the workings some twelve or eighteen months ago. They were then working under the road, close to that pit, in the Scale coal. I went through from one pit to another. I know the land belonging to Mr. Heywood. They are getting the Stanley Main coal there, but that is further from the gas company than Mr. Burnley's. The St. John's Pit is the one near Mr. Dawson's house.

Re-examined by Mr. MAULE: The land which I sold for 3s. per yard was for the purpose of erecting a printing-ink manufactory. I know the land on the vicarage side of the gas-works. I should not value that so highly, because it has no frontage.

Mr. *John Whitaker*, examined by Mr. MAULE.

I am the secretary and bookkeeper of the Wakefield Gas Company, and have been so for nearly thirteen years. Until the end of 1857 I also collected the company's accounts and rents. I am acquainted with all the concerns of the company, and know all their consumers and customers. I have made up all the books.

Mr. MAULE: Referring to your accounts for 1857, will you give us the actual expenditure for that year?

Mr. SHAW objected to the question.

The ARBITRATOR said he understood that it was agreed that whatever was given from the books should be taken *de bene esse* throughout, and that the books themselves should be produced for the respondents to test them.

Mr. MAULE: No doubt; the books are produced for the purpose.

Examination resumed: In 1857 the quantity of cannel purchased was 261 tons 8 cwt., at 9s. per ton, or a total cost of £117. 12s. 7d. The quantity of black coal purchased was 995 tons, at 5s. 10d. per ton—total £290. 4s. 2d. Of screened slack, at 4s. 4d., 2853 tons—total £618. 3s.; at 4s. 2d., 1492 tons—total £310. 16s. 8d.; and 4 tons of trial coal, averaging 5s. 5d. per ton—total £1. 1s. 8d. The entire quantity of coals purchased and delivered at the works in that year was 5606 tons 8 cwt., and the entire cash payments for same, £1337. 18s. 1d. From that tonnage I deduct 25 tons 8 cwt. for engineer's house and office, leaving a total for distillation into gas of 5580 tons. The average price, therefore, per ton for fuel coal was 3s. 9d. About 1005 tons were consumed in the furnaces for the purpose of heating the retorts, and above 800 tons of coke for the same purpose.

By the ARBITRATOR: That quantity of coke must have been used. We produce a certain quantity and sell a certain quantity; the remainder is applicable to fuel.

By Mr. MAULE: The estimated difference between what we made and sold was 817 tons. The average yield of coke per ton of coals carbonized was 12 cwt., and the total quantity 3348 tons. Our sales were 2531 tons, showing the difference of 817 tons. I assume 6 cwt. of coke per ton as the coke fuel distinguished from the coal fuel, and the average price in 1857 was 7s. 4d. per ton. The rest of the coke I should put for waste.

By the ARBITRATOR: The 2531 tons of coke sold at 7s. 4d. produce £931. 18s. 11d. The residue, 817 tons, was used for fuel or waste. The cost of fuel coal was—1005 tons, at 3s. 9d. = £188. 8s. 9d.

By Mr. MAULE: The value of the unsold coke, at 7s. 4d. per ton, was £299. 11s. 4d. The total value of the coal consumed on the premises both for fuel and distillation was £1526. 6s. 10d., which, added to the unsold coke, gives a total of £1825. 18s. 2d.

The ARBITRATOR: But then there will be some allowance for waste.

Mr. MAULE: I think we are entitled to the value of the waste as well as the other, because it enters into our cost, and it is unproductive.

Examination resumed: The 5580 tons of coal used by us in 1857 produced in gas measured at the station-meter 42,420,800 cubic feet, the yield being 7602 feet per ton. I have examined the company's accounts, and I find that their earnings for gas supplied to consumers in that year were £6946, the price then being 4s. per 1000 feet. That amount would be subject to losses by bad debts.

By the ARBITRATOR; I am not able to determine from the books what proportion of that amount has been actually received, but I am sure it has not all been paid.

By Mr. MAULE: That amount of £6946 represents a supply of gas equal to 34,730,000 cubic feet at 4s.; the remaining 7,690,800 feet is due to leakage, and is rather over 18 per cent. of the quantity manufactured. The fuel coal required for the ovens to produce that quantity of gas was 1005 tons, besides 817 tons of coke, and the quantity of coal carbonized was 5580 tons. The proportion of fuel to furnace coal is about two-fifths, or about 40 per cent. The average number of retorts in use in 1857 was 45. They were clay and iron retorts. We have two sorts of clay retorts, and by way of distinction they are respectively called clay and brick retorts. During the year there were 718 clay, 1214 iron, and 458 brick retorts charged. Dividing the total, 2390, by the 52 weeks, you get an average of 45. Of single retorts there were 18 brick, 39 iron, and 37 clay. The brick retorts are larger than ordinary; 18 of them are equal to 30 of the ordinary size. During the depth of winter we had 16 stokers at work, and at Midsummer only 4, giving an average per week of 9½. We had two purifying-men; one was kept on all the year, and the other during three-quarters. We had five directors that year, and they received each £20; and two auditors, who received six guineas each. We also employed an analytical chemist, whose duty it was to attend and ascertain the state of the gas, and once a week to send in a report to the directors. His salary was £10 a year. We had a secretary and bookkeeper, who received £110, with residence and gas, but not coals. We had also a collector at £1. 1s. per week. His duty was to collect the gas-rents; and it took nearly the whole of his time to do it. Our manager received £100 a year, with house, taxes, and coals; our gas-fitter, 25s. per week; meter-man, 25s. per week; glazier, 21s. These latter are bracketed together in the accounts, their total wages being £182. 4s. 1d.; but that sum includes overtime. The total amount paid for stoking comes to £486. 12s. 6d. We had two stokers at 25s.; two at 22s.; ten at 20s.; and two at 17s. 6d. We had two purifying-men: one at 20s., and an assistant at 17s. 6d.; together their wages were £70. 16s. 2d. We also employed a number of labourers at 2s. 6d. per day, and an office-keeper at 7s. 6d. per week. The total paid under this head was £123. 1s. 5d. We had also eight lamplighters, who received £192. 5s. 7d.; so that the total expenditure for salaries and wages was £1442. 3s. 9d. By our contract with the local board we are bound to light the public lamps within one hour from the specified time of commencing; and the number of lamps which each man lights is 72—rather more than one lamp per minute. The distance between the lamps in Wakefield is about 60 yards. Under the head of lime, clay, and royalty, in 1857, our payments were £180. 9s. 10d.; rates and taxes, £467. 4s. 5d.; wear and tear, £725. 14s. 10d.; and sundries, £190. 17s. 7d.; making our total expenditure £4832. 8s. 8d. During that year we received for coke 2531 tons, at about 7s. 4d. per ton—£931. 18s. 11d.

Mr. MAULE: Besides the quantity of coke actually sold, what is the value of the additional coke which you made and might have sold, 817 tons—what price do you put upon that? I want it put down as what we might claim as profit.

Witness: If we had not used the coke we should have burnt more coal for fuel.

The ARBITRATOR: Of course you must have a certain amount of fuel. The whole point which Mr. Shaw made was as to the waste. The fuel part is another matter.

Examination continued: For unsold coke I reckon £299. 11s. 4d.; for tar we got £200. 7s. 8d.; for spent lime, £39. 15s. 4d.; for ammoniacal liquor, £205; for clay, £50. 9s. 6d.—the total of these items being £1428. 1s. 5d. During the thirteen years I have been with the company, I have superintended the renewal of mains and their extension, and have from time to time purchased the new stock of pipes that were to be laid by order of the board of directors. I am therefore acquainted with the length of the company's mains, and their diameter in each street.

Mr. MAULE: Mr. Wilson gave us a minute estimate of the size and length, and we also proved the length by Mr. Tarbotton. I will not therefore go through that matter again, but merely supply some further information.

Witness: Of 12-inch mains we have 325 yards; of 10-inch, 480; of 6-inch, 1370; of 5-inch, 1341; of 4-inch, 4860; of 3-inch, 4151; of 2½-inch, 943; of 2-inch, 14,715; of 1½-inch, 1240; and of 1¼-inch, 590 yards in the township of Wakefield. In Alversthorpe and Thorne we have 273 yards of 5-inch, 1110 of 4-inch, 4509 of 3-inch, 270 of 2½-inch, 5457 of 2-inch, and 4445 of 1½-inch. In Sandal we have 495 yards of 3-inch, and 2744 of 2-inch; and at Stanley-cum-Wrenthorpe we have 2420 yards of 2-inch, and 250 yards of 1½-inch pipes.

Mr. MAULE: I think we ought to put down under the head of receipts the money paid by the corporation—viz., Lamp lighting, £216. 15s.; meter-

rents, £271. 19s. 1d.; and fitting rate (*i.e.*, hire of fittings), £20. 13s. 6d.; total, £509. 7s. 7d.

Examination continued: In 1857 the total amount of our bad debts was £175. 15s. 8d.—viz., on coke £87. 12s. 6d., and on gas £88. 3s. 2d. In that year the rates were as follows:—6th of March, a poor-rate of 1s. 6d. in the pound; on the 1st of April, a general district-rate of 1s., and a special district-rate for sewerage of 7d. On the 4th of June, a church-rate of 4d.; on the 26th of October, a second poor-rate of 2s.; on the 9th of November, a general district-rate of 1s. In March we had also a soke-rate of 3d., and on the 4th of February, a commissioners' debt-rate of 5d.; making a total of rates equal to 7s. 1d. in the pound. I remember Mr. Clarkson and Mr. Hammerton coming to our premises for the purpose of valuing them for this rate. On that occasion I gave them an account of our receipts and expenditure. I laid the books before them, and asked what they wanted. They told me, and I gave them the receipts and expenditure for five years.

Cross-examined by Mr. SHAW: I did not decline to let them look at the books. I had the books on the desk, and I said, "Here are the books from which I took the amounts, and you can look at them for yourselves." It was not a summary on one page only that I laid before them, and forbad them to look at any other part of the book. I heard what Messrs. Clarkson and Hammerton said on that subject, and was surprised at it. In 1847 I superintended the making a plan of the company's mains. We have made renewals and extensions since that time—not very large. We have gone into the borough; we were then only in the township. We did not extend the mains in 1857, but we altered the capacity to a very small extent. That was not done out of the annual receipts. The amount expended in enlarging the diameter of the pipes was £30. 16s. 3d. That was for main pipes, the material itself, and not for labour. The cost of labour would be included in wages; we did not charge the capital with any of that. The money we expended in mains was obtained from new shares and borrowed money, and went to capital account. I cannot say how much of the £123. 5s. expended that year in wages was for labour in laying down the enlarged mains. The pipe-layers and meter-men and smith have constant wages; we cannot turn them off, even if we had nothing for them to do in pipe-laying. The labour charged in the wages account would be principally for excavating. The rates at which we were assessed in 1857 were 7s. 1d. in the pound. I paid 3d. in the pound for the soke-rate, though I have been informed that it was illegal. I do not know that in the year 1857 no church-rate was laid in Wakefield. [Paper handed up, which showed the date of the rate to be June 24, 1857.]

Mr. WITHAM: No doubt it was a voluntary rate.

Cross-examination continued: I am not aware that the poor-rate extends over eight months, so that there would be only three in two years. I gave you the dates of them as they came in, and I paid them. I do not know that the general district-rate is a retrospective one. I paid it when it was laid. As to bad debts—our largest customers for coke are the maltsters, and we sell principally on credit. The accounts are made out half-yearly in general. The £87 lost that year was by the default of two maltsters. No part of the coke for which that sum is charged was delivered in 1856. One of the parties who owed it became bankrupt, and the other died, and it was then found that he was insolvent. In one case we got a dividend of 10s. in the pound, which I deducted before giving you the amount. The bad debts for gas were for small consumers.

By the ARBITRATOR: I cannot tell what the bad debts in 1856 amounted to. We generally estimate them at 1 per cent. The bad debts of 1857 were in excess of the average.

By Mr. SHAW: I cannot tell whether we had or not any losses by bad debts on the coke account in 1858, besides that arising from one of the failures I have referred to—the account extending into that year.

By the ARBITRATOR: We make up our coke account half-yearly. The loss we sustained in 1857 was for coke delivered in that year.

By Mr. SHAW: With one or two exceptions our gas-rents are paid half-yearly. We do not begin to collect them immediately the half year closes. We have not got out the Christmas accounts yet, and we are in the middle of January. Last half year we did not begin until the latter end of August. We do not very often cut off the gas if a person does not pay. I think we are very liberal in that respect. The £88 for bad debts in gas in 1857 I have taken from the ledger. It is not an unusually large amount; it is generally from £70 to £80.

By the ARBITRATOR: The £6946 which I gave as the gas returns was the amount earned—not the amount received. The sums I have given as losses on gas and coke are the amounts which are actually known to be bad debts—irredeemably bad, from the poverty and insolvency of the debtors. If it was simply a delay in payment, they would not be taken as bad debts.

By Mr. SHAW: I think the payments from the corporation are due on the 28th of January, and it is the latter end of February when we get the amount in. They do not pay punctually. We have a right to charge interest for their not doing so, but we have not charged it. The reason is not that they have charges against us for a short supply of gas, but because we think for the short time it is not worth while. Nor is it because occasionally the lamps are not lighted at the proper time—that occasionally the lamps go out at night, and therefore, when the corporation are a month behind, they claim a deduction. Some years ago they made a claim for a deduction.

The ARBITRATOR: But they could?

Witness: They could, I dare say. It is a legal question whether, if we do not deliver gas, we can demand to be paid for it.

By Mr. SHAW: The corporation pay us by the cubic foot for the lamps. We very rarely hear complaints that the lamps have not been lighted. Sometimes the Local Board of Health have complained; but we have found out, on inquiry, that the lamps were lighted. We do not complain of their mode of payment; there has been no objection made on either side. The amount we receive from the corporation varies according to the number of hours the lamps are lighted. In 1857 we did not largely increase the service-pipes of our consumers. There has been a gradual increase in the number of our customers for the last twelve years. Originally, the expense of putting down service-pipes to the customers' houses was paid out of capital. We do not lay service-pipes now at the company's charges; the consumer pays it in most cases. If it was a question who should pay for the service in a case where the party supplied is likely to be a large consumer, we should perhaps do it. The company are at the expense of the meters, and they charge a rent for them. These are paid for out of capital. In 1857 there was £167. 13s. added to capital for new meters, but nothing on account of service-pipes. Whatever expense we were at for them was paid for out of income. I have not taken out the amount so expended. The men employed in laying services are paid for out of revenue. We never charge wages to capital on any account. Our men superintend the joining of the service-pipes with the mains, and the wages for time so occupied is charged under the head of "smith and gas-fitter." The amount paid by the company for rates from Dec. 30, 1857, to June 30, 1858, was £312. 16s. 3d., and there was another rate which I did not debit the company with, as it was disputed; but we have had to pay it since. It was the rate at present in dispute, £123. 13s. 4d.

The ARBITRATOR: The fair way to do it would be, not to take that rate, but the rate as it would have been on the old scale, because this rate was paid under protest.

Mr. WITHAM: Even that would not be correct, because the poor-rate is a prospective one.

The ARBITRATOR: But supposing there had been a poor-rate laid in May, you must have taken that.

Mr. MAULE: If we only go to the 30th of June, 1857, we exclude a rate made on the 4th of May.

Witness: I am giving you the old amount of rate, £123. 13s. 4d.; the amount to be collected this year is £238. 4s.

Mr. SHAW: Then the rates which you have given include the poor-rate on the old scale?

Witness: No; it excludes it altogether. It was at the rate of 2s. in the pound.

The ARBITRATOR: It will be £436. 9s. 7d., instead of £467. 4s. 5d.

Mr. *Whitaker* recalled, and further cross-examined by Mr. SHAW.

I have prepared a statement showing the various rates paid by the company between the 30th of June, 1857, and the 30th of June, 1858. There was a poor-rate on the 26th of October, 1857, of 2s. in the pound; a general district-rate on the 9th of November of 1s.; a soke-rate of 3d. in 1858 (I have not got the date of it; it is an annual rate); a commissioners' debt-rate on the 5th of April of 5d.; a church-rate on the 14th of June of 3d.; and a poor-rate on the 21st of June of 2s. Together these rates amount to 5s. 11d. in the pound, and the total sum paid by the company was £436. 9s. 7d. The entire expenditure of the year 1857 was £4744. 3s. 10d., and the receipts £9140. 5s. 10d.. The items of receipt were—

For gas	£6,945	19	0
Lamp lighting, paid by the corporation	216	15	0
Meter-rents	271	19	1
Fittings hire	20	13	6
Coke sold	931	18	11
Tar sold	200	7	8
Spent lime	39	15	4
Ammoniacal liquor	205	0	0
" clay	50	19	6
Sundries	190	17	7
Rents of real estate	62	4	0
Abatements and discounts	3	16	3
	£9140	5	10

The items of expenditure were—

For coals	£1,526	6	10
Lime, clay, and royalty	180	9	10
Wages and salaries	1,225	8	9
Lamplighters	216	15	0
Rates and taxes	467	4	5
Interest on loans	223	12	2
Tradesmen's accounts (wear and tear)	725	14	10
Bankers' interest and commission	83	1	2
Estimated losses on net income, 1 per cent.	85	10	0
	£4,744	3	0

We file a statement of accounts with the Clerk of the Peace annually, up to the 31st of December in each year. We filed such an account in December, 1856. We commenced that year with a balance in the hands of the treasurer of £4. 1s., and ended with a balance of £1. 9s. 5d. At the same time the company were owing the treasurer £729. 10s. on the general account. On the 31st of December, 1857, we had a balance in hand of £40. 13s., and we owed the treasurer at that time £1615. 6s. 5d. The interest on loans, £233. 12s. 2d., was paid out of receipts; and during that year we divided among our shareholders £3897—*i. e.*, for the first half year £1732, and for the second half £2165. During the first half of 1858 we also divided £2165 among them. The rate per cent. was 8 for the first half of 1857, and 10 for the two subsequent half years referred to. We are not likely, I think, to have an increase in our dividends; you will prevent that. We have reduced the price of gas since the 1st of January, 1858, from 4s. to 3s. 9d. per 1000. The price charged at the time of making the rate was 3s. 9d., but these accounts are made up to the end of 1857, when the price was 4s. Our dividends were paid out of current income, and no part of them out of capital. We have borrowed £5000; that is the whole amount upon which we pay interest. The quantity of coal received into our establishment for the quarter ending December, 1857, amounted in value to £533. 13s. 7d. We do not keep a stock-book; the coals as they come in are entered on a slate, and once a month I check the amounts by the tickets, and enter them in the day-book from the coal-owner's invoices. The coal is received almost daily into the works. The £467. 4s. 5d. includes the taxes for all the townships.

Mr. MAULE suggested that, in estimating the amount due to Wakefield, one-seventh should be taken from this amount.

Mr. SHAW was content to adopt that course, except as respected the land-tax, which he said he should contend was not a tax to be deducted.

Cross-examination resumed: The amounts paid for rates and taxes were as follow:—Church-rate, £15. 6s. 2d.; Alverthorpe borough-rate, 13s. 10d.; Alverthorpe poor-rate, £1. 13s. 4d.; water-rate, £1; soke-rate, £18. 15s. 9d.; local board rate, £3. 1s. 9d.; Wakefield poor-rate, £92. 15s.; property and income-tax, £83. 6s. 8d.; local board district-rate, £100. 16s. 7d.; church-rate (Wakefield), £20. 12s. 2d.; Stanley poor-rate, 10s.; Alverthorpe watch-rate, £1. 5s.; water-rate (second), £1; Alverthorpe poor-rates (second), £1. 13s. 4d.; land-tax, £1. 1s. 6d.; Wakefield poor-rate, £123. 13s. 4d.: total, £467. 4s. 5d.

The ARBITRATOR: Will you give me the items which in argument you will object to?

Mr. SHAW: The objectionable ones I say are the £15. 6s. 2d., which was for a church-rate laid in 1856; the property and income-tax, £83. 6s. 8d.; and the land-tax, £1. 1s. 6d.

Cross-examination resumed: The poor-rates in this statement are assessed not only upon the works of the company, but also upon the secretary's house. In the new poor-rate, paid in January, the latter is assessed separately.

After some conversation on the point, Mr. MAULE agreed to throw over the excepted items, and to reduce the poor-rates by the sums at which the secretary's house had been separately assessed. The excepted items amounted to £106. 2s. 10d., and the net sum agreed upon was £361. 1s. 7d.

Cross-examination continued: For the year between June 30, 1857, and June 30, 1858, the rates were—Wakefield church-rate, £20. 12s. 2d.; Stanley

poor-rate, 10s.; Alverthorpe watch-rate, £1. 5s.; ditto poor-rate, £1. 13s. 4d.; Wakefield poor-rate, £123. 13s. 4d.; water-rate, £1; district-rate, £63. 13s. 7d.; Stanley poor-rate, 10s. 1d.; watch and district-rate. 6s. 2d.; Alverthorpe poor-rate, £2. 10s.; soke-rate, £18. 15s. 9d.; Wakefield church-rate, £15. 9s. 2d.; income and property-tax, £69. 16s. 2d.; land-tax, £1. 1s. 6d.; Wakefield poor-rate, £123. 13s. 4d.; water-rate, £1: total, £436. 9s. 7d.

A conversation ensued as to the deductions to be made from this amount for excess of poor-rate, church-rates, &c., which it was ultimately agreed should be taken as £78. 8s. 4d. Deductions were also to be made for the out-townships, leaving the net amount for the year £336. 2s. 9d.

Mr. SHAW said he now proposed to go into the particulars of the item, £725. 14s. 10d., for wear and tear.

The ARBITRATOR inquired whether there was anything in that item to which objection was taken?

Mr. SHAW said it would become a question of law whether those items came under the description of wear and tear.

Mr. MAULE said, perhaps some of the items did not legitimately come under that head; but if they were legitimate deductions, it did not signify what head they came under.

The ARBITRATOR: "A rose by any other name will smell as sweet."

Mr. LEE: So far as new material is concerned, Mr. Whitaker has carried it to capital account; so that there is only labour here.

The ARBITRATOR: If in the wear and tear they put down sums which are practically renewals, will that affect the statutable deductions to be made hereafter?

Mr. LEE: Yes, but there is nothing in this account to object to.

Mr. MAULE: I believe you have it on your notes, sir, that the new brick retorts are carried to capital, £485.

The ARBITRATOR: Yes.

Mr. SHAW: The next item is that of sundries. £190. 17s. 7d.

Mr. MAULE: That should be on the other side of the account, amongst the receipts.

Cross-examination continued: The item of £123. 1s. 5d. for labour, includes labour on extensions and for laying down enlarged pipes, the materials themselves being charged to capital. It also includes labour expended on retorts, except brickwork.

By Mr. MAULE: The labour, cost of extensions included, is not so much as £5.

By Mr. SHAW: The cost of materials for extensions during 1857 was—first half, £628. 10s. 1d.; second half, £261. 10s. We do not find any labour except for main-laying. The bricklayer who sets the retorts finds his own labourers. In the meter item there is no labour, except that which the consumer pays for. We have five retorts in an oven generally; they may be brick, or clay, or iron.

Mr. SHAW called for the coke-book.

Witness said he had not brought it.

Mr. SHAW called for the meter-book.

Witness produced an account of the state of the meter, which he said was taken from his own observations, and on which he founded his weekly report to the directors. In cross-examination thereon he said the quantity of gas produced per ton of coals in 1857, according to the meter, was, for the week ending Jan. 6, 7160 cubic feet; Jan. 13, 6180; Jan. 20, 7000: Jan. 27, 7100; Feb. 2, 7430; Feb. 9, 7000; Feb. 16, 7300; Feb. 23, 6780; March 2, 7000; March 9, 6888; March 16, 6900; March 23, 7380; March 30, 6420; April 6, 6540; April 13, 6250; April 20, 6600; April 27, 6070; May 4, 6600; May 11, 6470; May 18, 6560; May 25, 6340; June 1, 7349; June 8, 8940; June 15; 8690; June 22, 8420; June 29, 8943; July 6, 8033; July 13, 8750; July 20, 8640; July 27, 7900; Aug. 3, 7975; Aug. 10, 9200; Aug. 17, 7926; Aug. 24, 9000; Aug. 31, 8900; Sept. 7, 9340; Sept. 14, 8940; Sept. 21, 8210; Sept. 28, 8590; Oct. 5, 8390; Oct. 12, 7910; Oct. 19, 7868; Oct. 26, 7650: Nov. 2, 7700; Nov. 9, 7822; Nov. 16, 7755; Nov. 23, 7794; Nov. 30, 7817; Dec. 7, 7900; Dec. 14, 8163; Dec. 21, 8250; Dec. 28, 8260 cubic feet.

Mr. SHAW said his object in getting at these figures was to show that the company had adopted a better system of extracting their gas from the coal.

Mr. MAULE thought it was a pity to burden the arbitrator's notes with these details, when there was no dispute as to the total.

The ARBITRATOR: How do you account for getting more out of a ton of coal during the last half year than in the former? Had you a better mode of doing it?

Witness: No; I do not think that. There is, perhaps, more vigilance in cleaning out the retorts. The state of the retorts has very much to do with it. When they are new, which is generally in the summer, they do yield more gas. The average for the first half of 1857 is 7710 feet per ton. The average per ton from the beginning of 1858 is 8000 feet.

The ARBITRATOR: Mr. Shaw, can you tell me what your witnesses said was the average?

Mr. SHAW: Nine thousand feet, Mr. Clarkson said; and Mr. Hall from 8500 to 9000.

Witness: The average production of the half year ending Dec. 31, 1857, was 8307 feet, and the average of the whole year was 7710 feet per ton.

Re-examined by Mr. MAULE: We have 1873 meters, of the following sizes, viz.:—1039 2-light, 385 3-light, 301 5-light, 73 10-light, 42 20-light, 14 30-light, 7 50-light, 7 80-light, 3 100-light, 2 200-light. I gave Mr. Wilson the figures on which his estimate is based, and also the measure of the service-pipes. We have 1850 private consumers, and of these 1300 have had service-pipes laid at the company's expense, and 550 laid on their own. The company have discontinued laying down service-pipes for the last two or three years—it may be more. I cannot tell the average cost of repairing lamps, not having taken out the figures. The cost is included in the wear and tear. I recollect the contest in 1847 respecting a proposed new company. We bought off the threatened opposition at a cost of £1050. In June, 1857, there were eighteen new brick retorts erected; they were very good ones, and equal to thirty of the ordinary size. We found that they worked exceedingly well—beyond the average of the others—and the directors expressed themselves satisfied with them. The £190 for sundries is composed principally of the sale of old materials, and next to nothing for the sale or putting down of service-pipes. It is chiefly for the sale of the old iron retorts.

Mr. *Thomas G. Barlow*, examined by Mr. MAULE.

I am a civil and consulting engineer, and have offices in Parliament Street. I have had upwards of thirty years' experience in the practical working of gas-works. My knowledge extends to every department of the manufacture, and also to the valuation of such property for rating purposes. During my professional career, I have repeatedly valued gas-works with the object of letting them on lease. I have also been in the position of lessee myself, as the representative of my father, and carried on gas-works. I know the Wakefield Gas-Works, and have been acquainted with them for six or seven years. I have valued those works for the purpose of rating. I am familiar with the mode of rating on the principle of what is called the structural value. I believe that is the principle adopted generally by surveyors in valuing other descriptions of buildings for rating purposes. The method is, to ascertain in the first place the structural value, and then estimate the rent by a per centage upon it. I have applied the principle, and made an estimate upon it in reference to these works. In addition to the buildings included in the valuation, I have taken a rent-charge for the land occupied by the mains. I first take the land occupied by the works, which is 10,015 yards, out of about 15,000 belonging to the company; and I estimate that at 3s. per yard, or £1502. 5s. This includes all the land within the fence or boundary-wall, which is occupied in carrying on the works or covered with buildings. The value of the buildings as they now are I take at £6837, which, with the value of the land, gives a total of £8339. 9s. Upon this I allow 7½ per cent., or £625. 10s. I believe that that is the fair per centage which property of that description in the locality should be assessed at, and it is the rate at which other property of similar character is valued. From that sum I allow ½ per cent. for insurance on £1900, which is the value of the insurable buildings. That is equal to £9. 10s. I allow 1 per cent. upon the structural value of the buildings, £6837, for renewal and reproduction= £68. 7s. Deducting the insurance and reproduction-fund, it leaves £547. 13s. as the net rateable value of the station at Wakefield. Taking the mains at 30,015 lineal yards, and allowing them to occupy an average space of half a yard in width (the mean diameter of such pipes being 4 inches), I put a rent-charge of 1½ per yard lineal upon that, which is equivalent to £187 11s. 10d.

By the ARBITRATOR: I find, by inquiry, that 6s. 3d. per square yard is a very full price for the value of the frontage of the adjacent property. I take that at 25 years' purchase, which is 3d., and the half of that is £187. 11s. 10d. Added to the rent of the station, it makes the net rateable value in the township of Wakefield £735. 4s. 10d. Assuming (what is proved) that the length of mains in the out-townships is 17,716 lineal yards, I have taken them at 1d. per yard, or on the basis of 4s. 2d. per square yard for the suburbs, which is equal to £73. 16s. 4d.; and that, added to the value of the works and mains in Wakefield, gives a total rateable value of £819. 11s. 2d.

The ARBITRATOR: Do I understand you to say that is what a tenant, in your opinion, ought to give?

Witness: A tenant would give something more than that if the trade were included. I have made two other valuations on different principles.

Mr. MAULE: You have adopted the structural principle which we have just gone through?

Witness: Yes, because it is the principle usually adopted by surveyors in estimating the rateable value of factories, &c.

Examination continued: The amount which I have given does not include the value of the gasholders, &c. They are excluded because they are not hereditaments. Retorts and purifiers I look upon as trade fixtures or personal property. Whatever is attached to the freehold so as to constitute an hereditament is in the valuation.

By the ARBITRATOR: Some years ago—before the decision in the Cambridge Gas Company's case—I made valuations for townships upon the structural principle, but I have not done so since. The Cambridge case was again under consideration at the sessions about eighteen months, and the sessions then adopted the principle of structural value.

Mr. MAULE: Assuming that the whole of the works at Wakefield were to be constructed by a capitalist with a view to letting them out to a tenant, as an investment, what rent would a tenant give for the same?

Witness: I have not made any such estimate in which the mains are included, but merely the station at Wakefield.

The ARBITRATOR: Your supposition is that a capitalist constructs the works, there being nothing before but bare land?

Mr. MAULE: Yes; supposing he were to bring into existence the state of things as they now are *in statu quo*.

Witness: No; I have not made any estimate precisely in that way, because some parts of the works are much too large for others, and I have disallowed such parts as are in excess, estimating only for the producing power. The gasholders, for instance, are of twice the capacity required. A capitalist would only make them of a suitable size for the quantity of gas required, and I have assumed that he went there, purchased the land—on the surface of which there was nothing—and erected works capable of manufacturing 50,000,000 cubic feet of gas per year. I think he would do so for a rental of £793, excluding the mains and pipes, but including the plant. I assume that the outlay would be £11,500. I arrive at the quantity of 50,000,000 cubic feet of gas by taking the number of retorts actually in operation, and which I believe would be necessary for a capitalist to erect to do the same business. The number of retorts I have assumed is 104, which is substantially the fact, because 18 of those now used are double size. The mean number in use would be about 46, and the maximum 72. The total carbonizing power per diem would be 36½ tons of coal; but, as it is necessary to make a reserve for contingencies and for accidents, I deduct 5½, leaving 31 tons per day. I take 8000 cubic feet of gas to be produced per ton of coals, so that there would be a maximum production of 248,000 cubic feet per diem. I think in a town like Wakefield the yearly consumption of gas may be taken as 200 times the maximum daily consumption, and that would give 49,600,000 feet per year. In estimating what a capitalist would erect works of such capacity for, I apply the short rule which I use in calculations of this sort, of reckoning so much per annum per 1,000,000 cubic feet produced, which brings out an annual rent of £793. 12s. From this I allow ½ per cent. for insurance on the insurable part—viz., £9. 10s.; for renewal and reproduction, 1 per cent. upon £5015—£50. 3s.; and 3 per cent. upon £6428—the value of the trade fixtures—£192. 16s. 6d.: making a total deduction together of £252.

By the ARBITRATOR: I have not included the mains here, but will assume that £512 would be a fair rent for them as they now are.

Mr. *Whitaker* was recalled, and asked by the ARBITRATOR what had become of the difference between the expenditure and the receipts in 1857, and he replied that the surplus was in hand.

Mr. *Barlow* recalled, and cross-examined by Mr. SHAW.

I was present when Mr. Whitaker gave his evidence as to the total quantity of gas which was actually registered by the meter for the year 1857 at the gas-works, Wakefield, and that 34,726,000 was the quantity sold, leaving a difference unaccounted for of 7,694,800 feet, that difference being put down to leakage and condensation. He also stated that 5580 tons of coal were distilled in the year. Contrasting the quantity of coal distilled with the quantity produced, it gives about 7600 cubic feet per ton of coal. Taking that as the basis of my calculation, I estimate the receipts for gas, at 3s. 9d. per 1000, would be £6511. 2s. 6d. During 1857 the price was 4s.; in 1858 it was 3s. 9d. The actual amount entered as earnings in 1857 was £6945. 9s. Mr. Whitaker gave in evidence that the meter charge was £271. 19s. That I accept. I also accept the contribution of the corporation, which Mr. Whitaker put down at £217. 10s., but he gave it to me as £216. 15s. I did not

take the number of tons of coke mentioned by Mr. Whitaker as produced from distilled coal. Mr. Whitaker has only given evidence as to the quantity sold; he has given no evidence as to the quantity produced. I have taken 3487 tons of coke produced. I estimate that 3 tons of coal would produce 2 tons of coke, and I have assumed that the whole is sold at a mean price of 6s. 9d. per ton. A portion of it is sold at 7s. 4½d., and a portion is used as fuel. That portion used as fuel is only worth 5s. 1½d. per ton, inasmuch as 1 ton of coke is worth in heating power about a ton and a half of coal, and a ton and a half of coal would cost 5s. 1½d., I have taken the mean price of the whole as 6s. 9d. per ton. You cannot sell the whole of it in the market; it will not bear it. You are obliged to use a portion of it as fuel. 3487 tons of coke at 6s. 9d. will produce £1176. 17s. 2d. I take the tar as 55,800 gallons, at a halfpenny a gallon, yielding £116. 5s. I think the price they realized for tar last year was quite an exceptional price. Tar is an article that varies considerably from year to year. Mr. Lee stated in his evidence that in some places it was perfectly valueless. I know places where it is even an expense to the company to remove it. It was valuable last year in Wakefield. I allow 775 butts of ammoniacal liquor, at 3s. 6d. a butt, yielding £123. 7s. 6d. The sum realized by the company was considerably in excess of that. The value of ammoniacal liquor depends, to a great extent, upon the price of sulphate of ammonia in the market. In 1857 it was worth £20 per ton, but it has now fallen to £14 or £15. For the refuse lime, clay, and old metal, I assume that they would realize £70. I put the three items into one. Those are all the items I have under the head of estimated receipts, and they make a total of £8487. 1s. 3d. The other items of Mr. Whitaker's accounts I leave undisturbed. Lamp lighting, £217. 10s.; meters, £271. 19s. Those are the figures given to me. I have not taken into account the fitting-rents. As to the old metal, I cannot make that up to £190 at all. The rents of real estate I leave out.

Mr. MAULE: That is only an accidental introduction.

Mr. SHAW: I struck that out myself; there is no point about it.

Witness: Assuming that in 1858 the amount of gas produced was 34,726,000 feet, the quantity of retort coal required to produce that would be 5205 tons. In 1857 the actual amount was 5580. I put down 5205 because in the first part of that year the retorts were evidently out of condition. Assuming 5205 tons of distilled coal to result in 34,726,000 feet of sold gas, the quantity made per ton will be 8150 cubic feet. The price per ton of coal I have calculated at 4s. 10d. per ton, which would amount to £1257. 17s. 6d. The quantity of furnace fuel required to distil that amount of sold gas would be 1561 tons, at 3s. 9d. per ton, making £292. 5s. 5d. That would be the actual expenditure for furnace coal.

Mr. MAULE: If they paid for 1005 tons of fuel in 1857, and you say that they consumed 700 tons of coke as fuel for the furnace, would not that make 1700 tons of fuel altogether?

Witness: I think they consumed too much. I believe my allowance of 1561 tons of furnace coal is sufficient to distil 5205 tons of retort coal. I allow 170 tons of lime for purifying, at 14s. 6d. per ton—£123. 5s. I leave out clay and royalty.

Mr. MAULE: What do you allow as wages for an establishment of this calibre?

The ARBITRATOR: He is supposed to be advising a company, and is giving his idea of what ought to be.

Mr. MAULE: Assuming that you are advising a tenant, and estimating the wages he must ultimately give, what would you allow?

Witness: I should allow 2s. 6d. per ton of coal carbonized, or £697. 10s. per annum. That is simply for the wages of gas-making. I have analyzed Mr. Whitaker's statement of £1225 paid for wages, and I find that the wages forming a charge upon gas-making amount to only £622. 6s. 1d., rather less than my estimate. My belief is that 2s. 6d. per ton of coal carbonized is the lowest that can be allowed for a manufacture of this kind; it is the lowest I ever heard of. It ranges in other works from 2s. 6d. to 4s. 6d. within my own knowledge, according to the facilities they present. At Wakefield, the works are peculiarly well situated for economical labour. The coal is brought into the retort-house, and shot down in front of the retort-bed. Wages are very low in Wakefield; at present they are excessively low. Mr. Whitaker's account is £37 less than I have estimated.

Mr. MAULE: How do you account for the difference between your calculation and the actual state of things which Mr. Whitaker reveals?

Witness: I think, upon the average of several years, my calculation of 2s. 6d. a ton would be correct. I am placing myself in the position of a person advising a tenant, and I think he ought not to reckon the wages at less than 2s. 6d. a ton.

Mr. MAULE: Do you accept the salary of manager at £150?

Witness: No; I have an item of salaries in addition. I assume the tenant would require a staff of officers. I allow £150 for a manager. I allow £120 a year for a bookkeeper, and £125 for two inspectors. For lighting, cleaning, extinguishing, and repairing the lamps, I allow 13s. per lamp. There are 570 lamps, and the amount, at 13s. per lamp, would be £370. 0s. 10d. I allow 2s. per ton of coal carbonized for wear and tear of retorts, amounting to £554. That is my opinion, founded to some extent upon facts. My total estimate for wear and tear is £1105. Mr. Whitaker's statement was that it amounted to £752. 14s. 10d.; but in his account for wages he has £182. 4s. 1d. which ought to go to wear and tear. The wear and tear of purifiers, gasholders, valves, meters, trade fixtures, &c., I estimate at £176. 15s. Repairs and painting of building I put down at £60. Repair of roads and pavements—that is, for the purposes of mains, searching for leakages, &c., 30 miles—I estimate at £2. 5s. per mile, which would make £67. 10s. That is in all the townships. The company's mains extend over 30 miles. I allow the collector ⅔ per cent. upon the amount he collects, which would make £64. I assume that he collects the whole. I allow 1½ per cent. on the estimated receipts for bad debts, namely, £128. For incidental expenses, that I put down £100 a year. For rates and taxes I have allowed 6s. 8d. in a pound on an assessment, £1100 a year—making £366. 13s. 4d. All these items give the gross expenditure as £4633. 6s. 3d., which, deducted from £8487. 1s. 3d., leaves £3853. 15s. That would be the gross profits of the undertaking.

Mr. MAULE: Assuming that to be the gross profits, what do you allow for deductions to a tenant—not statutable deductions, but legal deductions—those which are recognized in Westminster Hall, whether by statute or not? Take, first, the interest of the capital required to carry on the trade—what floating capital would be required to carry on such a concern as this?

Witness: The floating capital required for the payment of current expenditure I take at £3500. I think that amount is necessary after hearing what Mr. Whitaker stated as to the mode in which the gas-rents are collected. I assume that the rents are due half-yearly, and collected as soon as convenient afterwards. In letting most gas-works to a tenant, it is customary to make him take and pay for that portion of the retorts that is burnt out periodically; he takes it as his own stock. Retorts last about twelve months; sometimes they last a little longer. Assuming a tenant to take the retorts at the Wakefield Gas-Works, he would have to pay £1040 for them. Then there is a certain capital required for the meters. In letting gas-works, the tenant generally takes the meters let out on hire to consumers. The value of these would be £3187. The total tenant's capital would be £7727. Upon that I allow, in the first place, 5 per cent. interest on his money—£386. 7s., and 20 per cent. as the tenant's profits, which is equal to £1545. 8s., making a total of £1931. 15s. I deduct that from the gross estimated profits already arrived at.

Mr. MAULE: Now, as to the statutable deductions; what value do you put upon the insurable buildings?

Witness: £1900, upon which I allow 10s. per cent., making £9. 10s. As to renewal and reproduction, I allow 1 per cent. on £6837, the value of the buildings—£68. 7s. 6d. I also allow 3 per cent. on £8338, the value of the trade fixtures after deducting the retorts—£250. 2s. 9d. The value of the mains I put at £8000, and allow 1 per cent. upon that—namely, £80. Upon the value of the meters, £3187, I allow 7½ per cent., making £239. 0s. 6d.

The ARBITRATOR: Why do you allow 7½ per cent. upon the value of the meters, when you have thrown them into the capital and allowed 5 per cent. on them?

Witness: Because there is otherwise no renewal-fund. For renewal of service-pipes I allow 10 per cent. on £750, which gives £75. For the renewal of the lamps, buildings, columns, brackets, iron-works, &c., I allow 2 per cent. on £1710—£34. 4s. The total items of the renewal-fund amount to £756. 4s. 9d., without deducting the insurance. Deducting this from the last-mentioned total, we have £1165. 15s. 3d. as the net rateable value of the works in Wakefield and the neighbouring townships. I included the gasometers and purifiers in the trade fixtures as things not attached to the soil. Though I call them trade fixtures, they are substantially included in the rateable value.

Mr. MAULE: Now, will you turn your mind to the apportionment of the sum of £1165. 15s. 3d., which we have arrived at between these different townships? How much do you deduct for the manufacturing station in Wakefield township?

Witness: £541, according to one of the estimates I put in last night. That is the sum I estimate the capitalist would sink in the production of such a building. Deducting £541 from £1165, the result is £624. That £624 represents the net rateable value of the mains in all the townships—the mains, service-pipes, lamps, and the whole of the other property.

Mr. MAULE: Having got to this £624 for mains in all the townships, you distribute that upon different bases I believe?

Witness: I and all other valuers are in a difficulty in that respect, in consequence of the ambiguity of the legal decisions thereon. If I were to estimate according to the length of the mains, the proportionate amount for Wakefield would be £391. Adding that to the buildings in Wakefield—viz., £541—the total will be £932. There is another mode of distributing the value of the mains—by the measure of their cubical contents. By that mode there is £471 due to Wakefield, which, plus the £541, makes £1012 as the rateable value in Wakefield. Calculating upon the basis of the structural value of the mains in the different townships, £410 would be due to Wakefield, which, plus the £541, would make £951; and, taking the receipts for gas in each of the townships as the basis for the distribution of the £624, £535 of it would be due to Wakefield. That, added to £541, gives £1076. I consider the calculation of 9000 feet of gas per ton of coal to be an exaggerated calculation. I do not believe it possible on a working scale to get that quantity.

Mr. MAULE: What life do you give to a gasometer?

Witness: A gasholder, if properly constructed, will last thirty years. As a renewal-fund for that I have allowed 3 per cent. Practically, you would find that in gas-works there is very little remaining after thirty years of the original works. I do not agree in the per centage of leakage allowed by Mr. Lee. His estimate is based upon 12½ per cent., which is below what should be allowed in the condition in which these pipes are. If Mr. Lee's figures were corrected, £468 should be deducted for additional leakage, and £750 more for diminished make of gas. These together would be £1218 in reduction of Mr. Lee's estimate of the rateable value. Besides this, he estimated the sale at 36,000,000 feet, but the actual sale was only 34,726,000, so that his estimate is 1,274,000 beyond the actual sale, making, at 3s. 9d. per 1000 feet, an excess of £238. 17s. 6d. I differ also from him in the price allowed for coke. He takes the whole as being sold at 7s. 6d.; practically, a portion is sold at 7s. 4½d., and a portion is used as fuel, which is really only worth 5s. 1½d. in comparison with coal. That gives an excess of 9d. per ton, making a further reduction from his estimate of £125. 0s. 6d. Mr. Lee has lumped tar liquor and several other receipts together at £634; I can only value them at £309—that gives an excess of £326. I know the company realized more last year, under exceptional circumstances, than I valued them at. Mr. Lee estimates the fuel by a peculiar process of his own. He calls it 3 per cent. upon the quantity of gas made. He took off 20 per cent. from the gas made, of which he said 12½ per cent. was to cover leakage, and 3 per cent. the fuel, and the rest was to cover the gas used on the premises. That 3 per cent. for fuel on Mr. Lee's estimate of the gas made comes, in money, to £67. 1s.; and my estimate of the fuel required is £313. 7s. 6d., the difference being £246. 16s. 6d., which, I say, Mr. Lee has allowed too little. He has allowed £888 for labour and salaries; my estimate is £1072, being a difference of £184. He has also allowed £656 for general wear and tear, without specifying what it is for. My allowance for wear and tear of retorts and works is £730. 15s., the difference being £74. 15s. Nothing is allowed by Mr Lee for painting and repairing the building, except under wear and tear; I have allowed £60 for repair of the buildings. Searching for leaks I have estimated at £67. 10s.; he has allowed nothing. Nor has he allowed anything for a collector; my allowance is £64. For bad debts Mr. Lee has allowed £67; I have allowed £128, making a difference of £61. In rates and taxes, Mr. Lee has allowed more than I have done. I heard the evidence as to the fluctuations in the cubical product of gas per ton of coal. The temperature has some influence on the expansion of gas. Gas is expanded about 1 per cent. in its bulk by an increase of 5° in the temperature. Assuming 7000 cubic feet of gas to be produced from a ton of coal when the thermometer is at 40°, the bulk would be expanded to 7280 feet if the thermometer rose to 60°, and to 7490 feet if it rose to 75°. Assuming 8000 feet to be produced when the thermometer is at 50°, the product would be 8320 if it rose to 70°. One can account for a considerable difference of temperature by the construction of the apparatus. At Wakefield they cannot cool the gas down below the temperature of the atmosphere. The new gasholder at Wakefield is a very bad job. The top, I should think, would require to be renewed in five or six years.

Cross-examined by Mr. SHAW: In my estimates I have, for the information of the company, worked out the results upon each of three principles. I do not give Nos. 1 and 2 as my own evidence; they are my calculations on different principles, and laid before the company for their guidance. I have not before valued any property near Wakefield. The value I put upon the

land was from information I obtained. I am aware that Mr. Lee, when he gave his evidence, had no access to the books of the company. I had access to them if I chose. I verified some of the items, as I was incredulous respecting them. I never valued a whole township or parish for the purpose of making a rate, but I have valued gas-works on the part of parishes for rating purposes. As to principle No. 2, I do not think it is a principle laid down by the decisions of the courts, but I have a conviction that it is a reasonable principle. My third system estimates the property at what it would let for. I have not assumed a certain state of things, but system No. 3 is based upon the actual facts given in evidence. I am aware of the requirements of Wakefield in regard to gas. There is a very large consumption for the population. I have only allowed 6s. 9d. per ton for the coke, because, although the portion sold realized 7s. 4½d., a part was used for fuel, and as such was only worth 5s. 1½d. in comparison with coal, giving a mean price of 6s. 9d. My estimate of the quantity of coal required for carbonizing is 1561 tons. The amount actually used is stated to be 1005 tons, but then there were also 750 tons of coke used as fuel. If you value the coke at 5s. 1½d., it matters little as to the amount, whether they burn coal or coke. Tar has a better sale at Wakefield than in some places. At present there is a large stock on hand. You may sometimes get as much tar as you like in London at a farthing a gallon. I know that the tar realized more in the year than I have estimated, but there is no evidence to show me that it was the produce of that year. I inquired as to the facilities for the disposal of tar, but not as to the quantity sold in the year. I have never myself been an agent for the sale of tar. Mr. Whitaker told me there was sometimes a ready sale, and that at other times it hung on hand. I was surprised when I heard that the tar realized £280. 7s. 8d. in the year. I have great doubts whether that was the produce of the tar in that year only. I inquired as to the facilities for the sale of ammoniacal liquor. I know what other gas-works in the neighbourhood get for it. A high price was realized because sulphate of ammonia was then dear. Sulphate of ammonia has been gradually falling throughout 1858. It began to fall, I think, in the spring, after this company contracted for the sale of their ammoniacal liquor. Mr. Whitaker has £281. 12s. 5d. for spent lime, clay, and old metal. I have put down £70. I have not taken clay or royalty into account on either side. For old materials (included in the £70) I allow £30. The only old materials which have any value are the old iron retorts, which are worth about 10s. each. I do not think the company's statement of receipts and expenditure affords an exact criterion of what the profits of the undertaking have been during the year. I do not mean to say that their accounts are untrue. Here, for instance, is an item of wear and tear. Now, they spent a large sum in new retorts, of which they had six months' wear. They carried the whole of that expenditure to capital, and they had six months' wear and tear out of it, and that is worth £170. The profit and loss account contains no allowance for the use of these retorts. I have charged 14s. 6d. for the lime. The price of lime in London at the time was a great deal more. Labour I have calculated at 2s. 6d. per ton of coal carbonized. The price will, of course, depend upon the labour market in the place, and upon the manner in which the works are arranged. I know the wages paid to workmen in the gas-works in the district. I assume that the tenant would want a manager, for which I have allowed £150. I think the present manager, with £100 a year, is underpaid. The company provides him with a house. He is a very meritorious man, and ought to be better remunerated. The lessee would superintend the general management of the work financially, like a person engaged in carrying on mercantile operations. He might, if he chose, save the amount paid for the bookkeeper. I consider that two inspectors are necessary for the purpose of adjusting the water-lines and taking the indices. An inspector might do thirty meters a day. There are 1800 meters, which are only visited once in three months—they ought to be attended to once in six weeks. I allow the collector ¾ per cent. I allow him the same upon the amount paid by the corporation—£1400 per year. If that was struck off he ought to have 1 per cent. The collector often has to call for sums as small as 1s. 6d. I have taken 6s. 8d. in the pound as the rates, because I was informed that that was the average. The total amount in 1857 I believe was 7s. 1d. I did not hear that two rates in Wakefield lasted a year and four months. In the 13s. per lamp I include 7s. 6d. for labour; that is the actual amount paid by the company—£216. 15s. I have allowed 4s. 6d. per lamp for repairs. That is an ordinary contract price. The other 1s. is for ladders, oil, &c. I know many places where they contract to repair the lamps for 4s. 6d. The companies in this district repair their own lamps, but they are entitled to charge for it.

Mr. SHAW: How do you get at the 2s. per ton of coal carbonized for the wear and tear of retorts?

Witness: I look upon it that there would be an average destruction of 55 retorts per annum out of the total quantity of 104. There may be cases where retorts will last eighteen months; from ten to fifteen months is the ordinary duration. It is no economy to make a retort last a long time. I would rather make the same quantity of gas in a retort in ten months than in fifteen months. I allow £10 for each retort.

Mr. SHAW: How do you make out £3500 the floating capital of the tenant?

Witness: I take it upon the basis of nine months' outgoings upon the expenditure, the outgoings being £4633. 6s. 3d. I assume that the tenant must have capital enough to carry on the concern for nine months. I am aware that the account for coals comes in only once in three months. The corporation account becomes due every six months, and is paid some time afterwards. Only a very small portion of the coke is sold for cash. Mr. Whitaker said it was sold at six months' credit; it is sold principally to maltsters.

Mr. SHAW: You allow £5 per cent. on tenant's capital, which you say is £7727: now, do you not know that that includes £1040 for retorts, which are always let with the gas premises?

Witness: Just the reverse; they are not usually let to an absolute tenant.

Mr. SHAW: Do you not know that the meters are taken by the tenant as part of the works?

Witness: Decidedly not. *Per se*, meters are not rateable; but, inasmuch as they contribute to the total earnings, they are rated indirectly. The tenant is usually compelled to take the meters at a valuation, and pay the amount. That is the case with the Dover Gas Company, of which I am consulting engineer. I do not think 20 per cent. tenant's profits on £7500 is an exorbitant amount, considering the risks attending the trade. There is a continual risk of explosions and fires. I think 20 per cent. is only a fair remuneration. In the case of the Dover works I valued on behalf of the company. I do not know whether I allowed 20 per cent. tenant's profits. I have no doubt I allowed 5 per cent. for interest. I agree that there ought to be a sliding scale; and I think it should commence at £500. For £500 I should allow 50 per cent. I never valued for so small a concern. For £1000 I should allow about 35 per cent.; for £2000 about 30 per cent.; for £4000 or £5000 about 25 per cent.; for £7000 about 20 per cent.

Mr. SHAW: Do you know of any case where 20 per cent. is allowed on £7000, beyond the 5 per cent. interest, and ample salaries for every officer?

Witness: I am not aware of any gas-work of this calibre absolutely let to a tenant. I allow 1 per cent. for renewal of the buildings. Some parts I assume to have a life of about forty years, and others seventy or eighty. Sixty would be about the average of the buildings. I do not allow compound interest, because a considerable portion of the fund has to be expended from year to year. The mean duration of the trade fixtures would be about twenty-six years. I have given sixty years for the mains, ten years for the meters, and seven and a half or eight years for the service-pipes. Sometimes service-pipes will go in five years. The lamp-posts will last thirty-five years, taking the average of the different parts. I have stated that the greater the heat, the greater the bulk of gas produced. I know it is said that 9000 feet per ton were produced in the cold weather, in December. That is what the meter-book says, but I do not think that is an accurate criterion, for the quantity of coal used from day to day is not ascertained by weight. Taking it for a whole year, it would be a fair statement, but not from week to week. In winter, gas companies often use a portion of cannel coal, which yields a larger quantity of gas than ordinary coal.

By the ARBITRATOR: I should think you might put out half of the renewal-fund at compound interest. I have often valued for the purposes of rating, and have invariably assumed the existence of a tenant with capital taking certain portions of the stock. I have not valued for parishes so often as for companies. I know nothing about the rating of railways. With regard to the retorts, there is a certain portion destroyed every year, and if you gave that portion into the hands of the tenant, you would run the risk of his failing or becoming bankrupt, and then you might lose the value. A case was recently under arbitration in this room in which a person had contracted with a company to manufacture gas at so much per 1000 feet, covenanting to keep the works in repair. He suffered them, however, to get into a very dilapidated state, and had to pay £4000. If he had not been a responsible man, that £4000 might have been lost to the company.

(To be continued.)

Miscellaneous News.

PROCEEDINGS OF THE MANCHESTER GAS COMMITTEE.

At a Special Meeting of the Manchester City Council, held at the Town Hall on Wednesday, March 2—the MAYOR presiding—the management of the Gas Committee again came under discussion.

The TOWN-CLERK read the proceedings of the gas committee, which recorded that at a meeting held on the 4th of February—Alderman Shuttleworth in the chair—a report was read from Mr. Macfarlane in answer to the charges brought against him by Mr. Peardon, and the men employed under him at No. 5 station. It was resolved by the committee "that the explanations of Mr. Macfarlane are entirely satisfactory, and his conduct proved to have been such as to merit the confidence of the committee;" but the explanations and statements of Mr. Peardon were deemed unworthy of credit, and his conduct deserving the severest censure. He was consequently dismissed as manager of No. 5 station. The two men who had expelled James Green from the station were also discharged. At a meeting of the committee held on the 11th of February—Alderman Shuttleworth in the chair—a letter was read from Messrs. Parkinson and Co., dated Feb. 3, in reference to the meters manufactured by them; also a letter from Mr. William Crosley, suggesting that as Mr. Lowe's health had not permitted him to undertake the proposed examination of meters with Mr. Hawksley, that Mr. Barlow be appointed in his place, with the understanding that a third person might be nominated by them in case they should consider it desirable to call in the assistance of an umpire. Both letters were referred to the meter sub-committee for consideration and report. At a subsequent meeting of the committee on the 25th of February—Alderman Shuttleworth presiding—the following letter was read from Messrs. Crosley and Co.:—

We beg to acknowledge the receipt of your favour of the 11th inst., ordering six 3-light meters for experimental purposes, and beg to refer you to the previous letter of our Mr. Crosley, of the 26th ult., which remains as yet unanswered. We invite the fullest investigation into the merits of our meters, provided such investigation is made by competent and disinterested parties; but we protest against the repetition of hole-and-corner experiments by persons selected exclusively by the gas committee, and more especially by such as have private interests to serve of a nature to warp their judgment in such matters.

The report of the sub-committee upon Mr. Cleminshaw's resignation was again considered. The subject was referred back to the sub-committee for further consideration. An amendment was moved that Mr. Cleminshaw's resignation be accepted, but it was lost—five voting for, and seven against it.

Alderman SHUTTLEWORTH moved that the proceedings of the gas committee be confirmed.

Alderman SIMPSON seconded the motion.

Councillor NEILL said he must apologize to the council for having another word to say upon the minutes of this committee. He was very glad to hear that the gas committee had taken energetic steps to set themselves right at their works shortly after the last meeting of the council, in quelling the spirit of insubordination manifested there, and trusted that things would now go on more pleasantly. He thought they had got out of the gas and meter discussion, too, without suffering a very great deal of injury, and that the public would gain a good deal by the information elicited, especially as to the overfilling of meters, &c. (Laughter.) At the last meeting, it would be recollected that he suggested the addition of a few members to the gas committee, and he had intended giving notice of a motion to that effect, but he found upon inquiry that the committee themselves, although they seemed somewhat favourable when it was mentioned, expressed some dissatisfaction with it, and looked upon it as a reflection. He was very sorry that they took it in that view, for he assured them it was not his intention to throw any reflection upon them, nor did he make the proposal in that spirit. ("Hear, hear," from Alderman Simpson.) He saw that the committee were divided into two nearly equal parties; the minutes of that morning bore out the fact that that sore was not yet healed, for they had divided on a most important question—namely, as to whether the resignation of their manager should be accepted or not, the division being five against seven. Now, he thought it was of the utmost importance to the council that the gas committee should have a manager possessing the confidence of the whole committee. (Hear.) If a house were divided against itself, it must fall. (Hear.) He did not augur much good from that committee until they had settled that question. It appeared to him that the council had a right to expect and demand that very shortly they would settle it, and give them such information as would satisfy the council, or show respect to their intentions, with regard to Mr.

Cleminshaw. He hesitated to express any opinion about Mr. Cleminshaw; he knew very little of it; but he could say this, that the opinions expressed by some members of the committee were certainly as derogatory to the character of Mr. Cleminshaw as a gas engineer, as anything that could be well expressed. Others spoke favourably of him. The best way to settle the difference would be to appoint another manager in the place of Mr. Cleminshaw. (Applause.) This was such an important question, one in which the council had so deep an interest, that it would not do to allow the gas committee to trifle with such an appointment as this. He hoped the chairman would be able on an early day to say that they had finally settled this dispute for ever. (Hear.)

Councillor RUMNEY said that truth demanded that Councillor Neill should not take to himself the credit of suggesting to the committee things which the committee had already done, for there was not the slightest connexion between his statements at the last meeting about the men at the yard and the facts, for the differences had all been arranged; therefore, let him not go away with the assumption that it was his suggestion alone that caused the amendment.

Councillor NEILL: I did not say so.

Councillor RUMNEY thought this was the inference sought to be conveyed as resulting from the discussion upon the matter at the last meeting, but there was nothing of the kind. He must also say that the committee had never considered the suggestion, though Mr. Neill might have obtained his information from members of the committee, some of whom had been charged with giving publicity to things which they should not have done. The suggestion, however, had never been discussed in the committee, and Mr. Neill had no right to infer what the committee would have done. He must also say that the illustration used by Mr. Neill at the last meeting was a most unfortunate one for his judgment, and would certainly have been brought against him with telling effect if he had persisted in using it—namely, that they had succeeded in effecting a very great saving this year over the past year. Well, that at any rate must be put down to the credit of the present committee, as contrasted with some former committee. He (Councillor Rumney) did not agree, he was sorry to say, very often with the proceedings of the committee, but truth demanded that this should be stated, because nothing that had been done since was at all affected by the suggestions made at the last meeting by Councillor Neill.

Alderman PILLING reminded the council that the least said was soonest mended. Though they were glad to have good advice, in this case it came rather late, for all that was proposed had been effected. (Hear.) He asked gentlemen to refrain from all observations upon this committee for the present. If they would allow them another month—up to the next meeting—he believed that everything would be settled to the satisfaction of the most sanguine member of the council. (Hear.) So far as the committee was concerned, he knew of no war or cause for uneasiness; everything appeared to be going on as fairly as it could be, and he believed in a few weeks, if nothing were said, that they would be in a very satisfactory state.

Councillor M'GILL remarked upon Mr. Neill's implied charges against the committee as to their mode of conducting excavations. He (Mr. M'Gill) had been at the trouble to ascertain what the cost of previous pits had been. He found that the excavation last year of the pit complained of cost 1200 odd pounds, but they had let one now by contract for £480. This certainly seemed a very great difference, but there must be something to account for it in the quantity of work done. A previous pit, done by contract, cost £920, and another cost £1298. The difference was extraordinary.

Alderman SIMPSON said he should be sorry for this discussion to close without his noticing Mr. Neill's remarks with reference to Mr. Cleminshaw. Mr. Neill said that there was a great variety of opinion in the committee with reference to Mr. Cleminshaw's services and qualifications as a gas engineer. He (Alderman Simpson) could only say that if any gentleman who wished to have information on that point would just take the reports of the proceedings of the gas committee as they had been received year by year, would notice the savings that he must have effected in the manufacture of the raw material, would see the steady progress that the works had made, and would come to the works and see how differently they stood to what they did when he first came into the position that he now occupied, they would have a triumphant answer to any statements that were derogatory to his character as a gas engineer. (Hear.) He (Alderman Simpson) would undertake to say that the proceedings of the committee during the long course of years in which Mr. Cleminshaw had been the gas engineer to the corporation, would show that during the whole of that time he had possessed the confidence of the committee, and never in one instance had he done anything which entitled him in the slightest degree to forfeit it. (Applause.) It was very easy for gentlemen to say that this man or that man was not competent; but he would try Mr. Cleminshaw by that which he had actually accomplished, which would clear his character from every aspersion that could be cast upon it. With reference to the alleged narrow division which took place a few days ago, he believed he might say that there was little, if any, difference in the minds of any of the committee as to the principles upon which a decision should eventually be arrived at with reference to the head engineer of the gas establishment. The only difference was a difference in detail, and that was already in process of being settled; in the course of the next meeting or two the question would, no doubt, arrive at a final and, as he believed, amicable conclusion. (Cries of "Vote.")

On the motion being put, the proceedings of the gas committee were confirmed, and the council proceeded with the other business on the paper.

UNITED GENERAL GAS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held on Tuesday last, March 8, at the Offices of the Company, Austin Friars—J. O. HANSON, Esq., in the chair.

The usual preliminaries having been complied with,

The SECRETARY (D. W. Ogg, Esq.) read the following report:—

We have convened this half-yearly general meeting in compliance with the provisions of the company's charter; and in laying before the proprietors a report of the last half year's operations, it will be seen that the receipts amount to £6006, being £1133 less than the corresponding period of 1857, and £309 more than the profits of the half year ending June last. This deficit is not caused by any diminution of business at Dublin, where the increase in both rental and sales of coke has exceeded the diminished revenue caused by last year's reduction in price. Corresponding advantages in manufacture have also been obtained, and when the new retort-house (entirely fitted with clay retorts) is got thoroughly into action, we may fairly anticipate improved profits. The company's engineer reports favourably of this building and apparatus; and, notwithstanding the usual difficulties attendant on the adoption of a new mode of manufacture, which was put fully into practice at the commencement of winter, yet, upon the whole, the results of the use of clay retorts have been satisfactory. The second large gasholder, referred to in the last report, although not finished by the time expected, is now completed.

Some further extensions of large mains will be required in the course of this year, by which the distribution of gas in the city will be economized—the materials for which are already in stock. At the Kingstown station the increase and demand for gas will require additional retorts and storeage, and we intend removing one of the 60-feet gasholders from the works in Dublin and re-erecting it at this station, the cost of which, together with the mains before alluded to, it is expected will not exceed £1200.

At Cork, affairs are much in the same condition as last half year, with the exception of an increased number of customers, partly resulting from a better feeling towards this company.

Since the last meeting we regret to report the death of Mr. Shea, the agent. We have appointed a highly respectable gentleman to succeed him—Mr. W. J. Shaw—and from his business habits, and intimate connexion for many years with Cork, we have every reason to expect he will prove an active and efficient agent for the company at that city.

At Limerick the business exhibits a small improvement up to the 31st of December. Since then, however, a contract has been entered into with Government for fitting up and lighting the interior of the three barracks at this station. When in full supply we expect a large addition to our rental.

We are happy to announce that since the accounts were made up the stock of coals at Dublin has been accurately ascertained, and shows a surplus beyond the account charged of 2700 tons. The value of this surplus will go to the benefit of the current year.

We have the pleasure to recommend the proprietors to declare the same dividend as before out of the profits of the past half year—of 12s. 6d. per share, free of income-tax—and the balance to be carried to the stations contingency account, as usual.

The CHAIRMAN then said: Gentlemen, it gives us great pleasure at all times to meet the proprietors, and particularly on those occasions when we can lay before them a satisfactory account of the progress of the company. All the proprietors have had an opportunity of examining the accounts, in the accountant's office, and therefore I will not detain them by making a lengthened speech, but I will merely refer to some of the most interesting features and changes of the last half year. The profit and loss, as stated in the report, is £6006, which leaves a surplus, after a dividend of 12s. 6d. per share, of £381. If we contrast the accounts with the corresponding period of 1857, and if we take credit in the present half year's accounts for the ascertained surplus of coals, that surplus would be £1634. In the accounts of 1857, we took credit for the supposed surplus of coals; but in the present half year we have not done so, because the auditors, I think, very properly said they could not pass any account of surplus of coals unless we had it verified and certified by the storekeeper as well as by the agent. (Hear, hear.) Unfortunately, those certified accounts came to us too late to be put into the accounts of the half year which have been read to you. If we take credit for the 1700 tons of coals which belongs properly to the last half year, the surplus, after paying the dividend, would be £1634 against an amount of £1514, the surplus of 1857, showing that the accounts are somewhat better than they were in the year 1857. The auditors have very properly noticed this fact, and I am sure the directors concur with them fully in the suggestion they have made, that we should take means of ascertaining accurately, at the time the accounts are made up, what is the real surplus that we have. Unfortunately, some years ago we suffered from a deficiency, and I believe it is very much owing to the over-anxiety of our agent in taking care to be on the right side, that he has charged himself 6 or 7 per cent. more for coals than he has used; but we have written to him to come over as soon as he can be spared from Dublin to confer with us, and I hope we shall take means next year not to have any discrepancy between the coals charged, and the surplus that we afterwards ascertain to be correct. (Hear, hear.) No doubt the system is a bad one, because it affects the coke question, the make of gas, and the wasteage; but, looking into the accounts, corrected as they have been, I find that the coke sales come to about 68 per cent. upon the coals actually used, which I believe is a very good sale for coke; and the wasteage account so corrected does not exceed 25 per cent. In speaking of the accounts of the last half year, I will notice some of the principal features. The coals have cost much less than in the corresponding period of last year; there is a very considerable saving of 25 per cent. in the wear and tear; and I see that the amount of bad debts is not more than 2 per cent. upon the amount of the private rental. (Hear, hear.) That shows that our rental is very well looked after, and collected in. The deficit of profit, as stated in our report, apparently is £1133; but, if you take credit for what we now ascertain to be the surplus of coals, the amount is somewhat larger than it was in 1857. This seems a very satisfactory surplus, but we have a very large amount to provide for at Dublin for our works (and there is a reduction in price in operation since Jan. 1). The proprietors will get the benefit of the surplus in the current half year; and we have thought it much better not to attempt to pay a dividend which we possibly might not afterwards maintain. (Cheers.) The new works at Dublin are progressing satisfactorily, as the report states; and I have no doubt that when we have got up our new gasholder, and the retort-house is in full work, we shall find a considerable improvement. (Hear, hear.) It has been to a certain extent put into use, but, being a new process of clay retorts instead of iron retorts, it has been attended with some difficulty. But, as I have said, when everything is completed, we shall no doubt find a great improvement in our wear and tear and in the distribution of our gas. At Cork, our customers are still on the increase, for I find they amount now to nearly 1300, which is an increase of upwards of 258 since the last half year. According to the Act of Parliament, we have been obliged to furnish to the Clerk of the Peace at Cork a statement of the Cork accounts separated from the general accounts, and which has been delivered in. At Limerick the increase of rental is not very large, but still it is an increase, and I think, with the prospect of the barrack lighting, we shall go on well for the next half year. I may just state a fact to show the nature of the opposition we are subjected to at this station. I merely mention it to show the proprietors the difficulties which we have to meet in business. A short time ago, there was some public lighting that had run out; tenders were called for, and each company was called upon to tender. Our tender was 12s. below that of the corporation gas committee of Limerick. One would have thought, as a Government contract, the commissioners would have felt bound to have accepted the lowest tender, particularly coming from a company like ourselves, who had always supplied the lighting without any complaints; but, to our great surprise, the Harbour Board Commissioners accepted the tender of the corporation gas committee, being actually, some of them, members of the Harbour Board themselves! (Loud cries of "Shame!") With respect to the general assets of the accounts, we have a large available balance; at the same time, we have to pay for the Kingstown gasholder and other requirements about £6300 in the course of the next six months. We have already paid £6550, though it has not yet come in a definite way into the stations contingency fund, because the account is still open, and there are other items which will have to be added to it. Our accountant has not yet transferred that to the debit of the contingency account, but at the end of the year, when we have made all our payments, our stations contingency fund will consequently be considerably lessened. With respect to the surplus of coals now ascertained, it will remain to be decided whether it shall be carried to profit and loss or the stations contingency fund or the coal account. When our agent comes over from Dublin, we shall then have an opportunity of disposing of this. (Hear, hear.) I have no further observation to make, but as this company have nothing to keep back, I shall be happy to give every information in my power. (Applause.)

Mr. BOODLE moved that the report and accounts now read be received and adopted.

Mr. W. B. RHODES, in seconding the motion, said he supposed the clay retorts which had been alluded to were not put in use till the iron ones were worn out.

The CHAIRMAN: Certainly not.

Mr. CHAPMAN: A few are still in work that have been working for sixteen months, and they are not yet worn out.

Mr. RHODES inquired whether the directors thought it desirable to remove the gasholder which was spoken of in the report from one district to another.

The CHAIRMAN observed that it was only eight miles from Dublin to Kingstown, and that the directors, having considered the matter, thought it cheaper to remove it; because when the second large new gasholder was in use, there would be no further requirement for it at the works.

Mr. RHODES said he only wished economy to be practised, and he did not at all intend to find fault with what the directors had done. On the contrary, he thought the course which they had pursued was one that did them infinite credit; and if the Government, or those gentlemen who were appointed commissioners, did not think it their duty to accept the lowest tender, the directors were not to be blamed, and the shareholders, he was sure, would feel very great satisfaction with the accounts and the explanations which the chairman had given.

Captain SHEA: Was there any protest against the course of the corporation of Limerick in adopting the highest tender?

The CHAIRMAN: We thought it so flagrant a case, that we communicated with the Board of Works at Dublin, through their secretary, and were in hopes that they would not sanction such a proceeding; but, to our surprise, they have done so.

Mr. GODFREY: As one of the auditors, I am anxious to offer some explanation, having made a memorandum upon the accounts which might have the appearance of a censure on our part which was not intended. As the quantity of coals was not ascertained when we made up the accounts, we thought it was only our duty to make the memorandum; and I take this opportunity of saying that we have been assisted most materially by our worthy chairman, and also by the accountant. Perhaps I may take the liberty of suggesting that inasmuch as this surplus will not have been earned during the next half year, if it is to be distributed in dividend at all, it should be distributed as a bonus; but if at that time there should be a want of funds, perhaps the better way would be to make use of the surplus for other purposes. (Hear, hear.)

A resolution adopting the report and accounts passed unanimously.

A resolution for the payment of a dividend at the rate of 12s. 6d. per share, free of income-tax, out of the profits of the past half year, payable on the 4th of April, passed unanimously.

Captain SHEA moved a vote of thanks to the chairman and directors, for the admirable manner in which the affairs of the company were conducted; and in alluding to the step taken by the commissioners at Limerick, he designated it as "a job." ("Hear, hear," and a laugh.)

The motion having been seconded, passed unanimously amid loud cries of "All, all."

The CHAIRMAN, in acknowledging the compliment, said it was extremely gratifying to the directors to find that although they had great trials to struggle with, yet they had the confidence of the proprietors, and he could assure them that that confidence was the best stimulus for pursuing the same course, and he hoped they would do so successfully. (Applause.)

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Annual Meeting of the Shareholders of this Company was held at the Albion Hotel, Aldersgate Street, on Tuesday, the 1st inst.—ERASMUS WILSON, Esq., F.R.S., in the chair.

The SECRETARY (Mr. Ohren) having read the notice convening the meeting and the minutes of the last court,

The following report of the directors was presented:—

The directors have the pleasure of reporting the continued success of the company.

The new gasholder, mentioned in the report for 1857, is completed, and has been in operation during the past winter. The storage room for gas amounts, therefore, at the present time to 210,000 cubic feet.

It has been necessary to increase the extent of trunk mains, not only to meet a larger demand, but also to equalize the distribution of the gas; so that each portion of the district shall have its full supply without encroaching on that of its neighbour.

The Act of Parliament applied for last year has been granted. The Act gives power to the company to hold half-yearly meetings, and the directors propose to avail themselves of that power to divide the profits half-yearly instead of annually, as has been the custom heretofore.

The unallotted shares offered to the shareholders during the past year have all been taken up, and the deposit of £2 paid; the whole of the shares of the company are therefore distributed.

The directors have been long impressed with the necessity of having at their disposal the means of increasing the extent of the company's works, whenever they might be required to do so by the enlarged growth of the district. With this view they have made several attempts to purchase adjoining land, but were unable to obtain it on other terms than those of lease. They were, therefore, glad to avail themselves of an opportunity which occurred during the summer of purchasing two and a half acres of land immediately opposite the present works. This freehold land has been laid out with great care, so as to admit of the future erection of complete and commodious works; and as additions to the present works are required from time to time, they will be made on the new land. For example, at the present time all the retorts in the works are in full use, and instead of enlarging the present retort-house, which would have encroached inconveniently on the yard, and interfered with the storage of coal and coke, the new beds of retorts have been built on the new land, and form a part of a future retort-house, to be completed as required.

The directors are convinced that it is desirable to supply gas at the lowest rate that will ensure a fair commercial profit; they therefore think that the time has arrived for a reduction of the price to the private consumers in your district, and they have accordingly announced an immediate reduction to 5s. 6d. per 1000 cubic feet, in the belief that the increased consumption will fully make up the temporary loss of rental occasioned thereby.

The directors going out of office by rotation are Mr. Charles Aird and Mr. William Morrison, and these gentlemen, being eligible for re-election, offer themselves to the shareholders for that purpose.

The auditor going out of office during the present year is Mr. William Pashley, and being eligible for re-election, offers himself to the shareholders for that purpose.

The directors have, lastly, to call the attention of the shareholders to the accompanying balance-sheet, by which it will be seen that the profits on the year amount to £2952. 8s. Out of this sum the directors recommend the declaration of a dividend on the capital of the company at the rate of 6 per cent. per annum, which, after writing off the sum of £150 for preliminary expenses, £208. 7s. 9d. for parliamentary expenses, and £200 for depreciation on land, leaves a balance of £285. 0s. 1d. to be carried to the profit of the next half year.

The annexed statement of accounts was taken as read:—

Dr. CAPITAL ACCOUNT, DECEMBER 31, 1858. *Cr.*

To amount for plant	£12,299	7	0	By proprietors for paid-up capital—				
Sydenham shares	8,533	4	6	3430 £10 shares, fully paid	£34,300	0	0	
Freehold land	2,542	13	7	1570 ditto, £2 per share paid	3,140	0	0	
Mains	14,066	18	6					£37,440 0 0
Meters and services	2,277	4	2	Loans				8,850 0 0
Preliminary expenses	3,734	13	1					
Parliamentary ditto	833	11	0					
Office furniture	119	2	8					
	£44,406	14	6					
Balance to trading account	1,883	5	6					
	£46,290	0	0					£46,290 0 0

Dr. TRADING ACCOUNT, DECEMBER 31, 1858. *Cr.*

To stock on hand	£ 746	3	10	By balance from capital account	£1,883	5	6
Amount due from sundry persons	1,250	5	1	Amount due to sundry persons	2,279	10	3
Rental and arrears	3,529	4	8	Profit and loss	2,952	8	0
Balance at bankers	1,589	10	2				
	£7,115	3	9		£7,115	3	9

Dr. PROFIT AND LOSS, DECEMBER 31, 1858. *Cr.*

To amount for coals carbonized	£4,230	1	11	By balance unappropriated, December 31, 1857	£ 100	0	8
Lime, oxide, and sundries	417	16	10	Gas and meter rental	9,892	12	4
Retorts, fire-bricks, &c.	20	12	5	Coke made for sale	1,925	11	0
Trade charges, repair of meters, and machinery	186	6	2	Breeze ditto	49	4	7
New services and repairs	21	5	9	Tar ditto	52	18	10
Rent, rates, and taxes	950	18	11	Sundries	14	5	0
Law charges	138	12	10	Sulphate of ammonia ditto	189	12	3
Directors' and auditors' fees	271	0	0	Dividend on Sydenham shares	438	0	7
Salaries	377	0	0	Interest on deposit at bankers	104	18	7
Collector's commission	106	19	1				
Wages	1,127	0	5				
Petty works and office expenses	229	0	1				
Interest on loans	431	8	2				
Bad debts and allowances	34	16	3				
Wear and tear off plant and mains	1,046	19	8				
Ditto off meters and services	227	14	5				
Ditto off office furniture	7	2	11				
	£9,814	15	10				
Balance	2,952	8	0				
	£12,767	3	10		£12,767	3	10

APPROPRIATION OF BALANCE.

Dividend on share capital, at 6 per cent. per annum				£2,109 0 2
Preliminary expenses, to be written off	£ 150	0	0	
Parliamentary expenses, ditto	208	7	9	
Land account, ditto	200	0	0	
				558 7 9
				£2,667 7 11
Balance to be carried to next account				285 0 1
				£2,952 8 0

The CHAIRMAN moved the adoption of the report and accounts. In doing so, he said he should only feel it necessary to advert to a few points connected with the report itself. The company, he thought, was getting into that happy position when there was but little to call forth fresh congratulations at the meetings of the proprietors. They had arrived at that even and steady state of progress in which grand successes or failures were not likely to fall in their way. Their existence as a company was of that daily plodding nature in which, if at the conclusion of the year they were able to find that they had made a fair dividend, they must be perfectly satisfied, without having eclipsed the moon on the one side, or endangered the existence of the Thames on the other. In the present report, therefore, there was nothing so exciting or stirring as had probably been the case in some former reports. The proprietors, however, would find that the new gasholder which was in progress had been satisfactorily completed, and that the operations of the

directors during the past year had consisted of laying down large trunk mains, so as to render the circulation of the gas throughout the district as free as possible, and to supply the district to the extremest limits with all the facilities which proper arrangement of the mains admitted of. The report alluded to another matter to which the attention of the board had been directed. The district lighted by the company's works was, as they were aware, a peculiar one. It was not like the horizontal plane of London, but presented numerous hills and valleys, and sometimes their mains had to make an ascent up one side of a hill, and a descent upon the other, in order to supply the district beyond the hill. This occasioned engineering difficulties which the metropolitan companies had not to contend with, and sometimes had the effect of throwing obstacles in the way when they were least expected. For example: on the recent occasion of the Crystal Palace being lighted with gas, the consumption was so large that the effect upon the company's mains throughout the whole district was similar to that of a sucking-pump, and for a time the consumers in the lower parts of the district complained of a diminished supply, which was owing to the large quantity of gas absorbed by the Palace at the top of the hill. To obviate this inconvenience the company had now so arranged their mains that they were independent of each other. The low-lying district had a main independent of the high-lying district, and neither was likely to affect the other; and they had so arranged their mains as to make the free circulation of the gas as perfect as possible. It was also noted in the report, that, by the provisions of their recent Act of Parliament, they were enabled to meet half-yearly instead of annually for the purpose of dividing their profits. Heretofore they had laboured under the inconvenience of being able only to declare a dividend every twelvemonths, which naturally affected the value of the shares, inasmuch as that was a long time to wait for the interest on their money. To remedy that, therefore, was, in his opinion, a further step towards the success of the company. He passed over the subject of the purchase of the land, by merely saying that they considered themselves fortunate in securing a piece of freehold ground so close to their present works, and having direct communication with them—a piece of ground which was capable of accommodoting as large works as could ever be required for the district, however much it might extend. When their works were originally built they were intended for a comparatively small district; but the population of the neighbourhood had increased to such a degree, as to require infinitely larger works than were required a few years back. This was the fifth annual meeting, and from the first they had been gradually increasing their works to meet the demands of the large district that was growing up around them. In spite of having been under the necessity of purchasing freehold land, of having to expend a large sum in laying down additional trunk mains, and in arranging those connexions by which the different portions of the district might be supplied, without interfering with each other—in spite also of being in the position to be able to declare the moderate dividend of 6 per cent., they also found themselves enabled to reduce the price of their gas. The subject of the reduction of price was before them at the last meeting, and the proprietors would remember that it was adverted to as a desideratum of the utmost importance, and one which the directors would only be too happy to recognize as soon as the opportunity to do so occurred. They thought the opportunity had now arrived, when, without detriment to the interests of the company, they might reduce the price from 6s. to 5s. 6d. per 1000. Under the circumstances of their being a young company, having only completed their fifth year—under the circumstances of the very large outlay that was required—and under the circumstances of the cautious management, which alone could make any undertaking of this kind successful, they had considered that they were not in a position to make this reduction at an earlier period, and they now felt, in making the reduction of 6d. per 1000, they were doing as much as, under the circumstances, it would be judicious to attempt. Probably in future years they might find themselves in a position to be able to make a further reduction, but at present 6d. per 1000 feet was all they could afford to do; and any further reduction would be gladly made as soon as the opportunity occurred for their doing so. This reduction, it was to be borne in mind, was not in consequence of any enormous profits that they were making. They would all agree that 6 per cent. for their money in an undertaking of this kind was the least they ought to have. Indeed, it was less than under the circumstances they were fairly entitled to. It was not like having their money in Consols; it was not as if their money was placed in such a fixed position that there was no hazard to it. But in the present age, when light was borrowed from the magnet to illuminate the world—when they were threatened with discoveries which would put out gas altogether—it was necessary to secure to gas proprietors a remuneration such as would not only answer their present ends, but also *recoup* them for the possible absence of their profits at a future period. These were all the remarks he thought it necessary to trouble them with, but he should be happy to answer any questions which proprietors might wish to put to him.

Mr. C. Lea Wilson seconded the adoption of the report.

Mr. H. Palfrey Stephenson, the deputy-chairman, replied to several questions put to him by the Rev. Mr. Pocock and others. He said a portion of the share capital had been paid up during the past year, and the 6 per cent. interest was calculated upon the shares which were paid up fully at Christmas last. The directors had considered it right to spread the parliamentary expenses over a period of four years.

The Rev. Mr. Pocock said he observed an item in the accounts of £431 for interest on loans. Judging from those accounts, he should say there was now no necessity for the company to have any borrowed money.

Mr. Stephenson said it was a matter of necessity, the money having been raised on debentures, which could only be paid off as they became due. The directors felt justified in borrowing money as a matter of economy. Unless they issued share capital to a larger extent than they had, they could not do without borrowed money. They had expended £44,000, whereas they had only called up £37,440. The difference must be made up in some way, and they had done it by borrowing money, rather than add to the capital. Unfortunately, some of the money borrowed upon debentures was raised when money was at a high rate of interest, but they had no debentures upon which they paid a higher rate than 5½ per cent.

The Rev. Mr. Pocock said, with regard to the deductions for preliminary and parliamentary expenses, he found, on looking at the figures, that if those amounts had not been withdrawn, the proprietors might have divided 8 per cent. instead of 6 per cent., and yet have left a balance of profits in hand.

Mr. Stephenson said the board did not wish to place the company in the position of the man who spent every year all money which he made in that year. They might have divided 8 per cent. this year, but possibly might not be able to do so next; and, as the honourable proprietor was aware, nothing so much affected the commercial value of shares as an inequality in the rate of dividend. The board had therefore adopted the principle of not increasing the rate per cent. until they felt perfectly sure that they should be able to maintain that increase.

The motion was then put and carried unanimously.

The Chairman said he had to call attention to the alteration effected by their Act of Parliament—namely, that whereas the dividend was formerly declared by the directors, it was now, under the provisions of the Act, merely a recommendation from the directors, and it was left to the proprietors themselves to declare by their vote what the dividend should be. He had, therefore, to propose, "That a dividend be now declared on the paid-up capital of the company at and after the rate of 6 per cent. per annum, less income-tax."

Mr. G. Fasson seconded the motion, which was at once adopted.

The retiring directors, Mr. C. Aird and Mr. W. Morison, and the retiring auditor, Mr. W. Pashley, were severally re-elected.

The Chairman proposed, and Mr. Rymer seconded, a resolution increasing the remuneration of the auditors from £10 to 15 guineas each per annum.

Mr. Stephenson said they were now under an Act of Parliament, incorporated with which were the Lands Clauses, the Gas Clauses, and the Companies' Clauses Consolidation Acts. One of the clauses of the latter Act provided that a general meeting of the proprietors should determine the amount of salary to be paid to the secretary. In their own case he could truly say they had a most efficient officer, and he (Mr. Stephenson) perhaps felt it the more, as he was not quite in accord with the previous officers of the company. The directors were prepared with a recommendation, not as the measure of Mr. Ohren's services, because he hoped they should be in a position to increase his remuneration from time to time, as the growing prosperity of the concern might warrant their so doing; but they ventured to recommend that the salary of Mr. Ohren be fixed at £250 per annum, with an addition of £25 in lieu of a residence.

Mr. Box said he considered that the services of an efficient officer like Mr. Ohren ought to command at least £300 a year, and he should move to insert that amount in the resolution.

Mr. Stephenson said the directors had not the slightest objection to the proposed increase to £300.

Mr. Lea Wilson seconded the motion as amended, and it was carried unanimously.

Mr. Ohren briefly acknowledged his obligations to the proprietors for the very kind manner in which they had recognized his services.

The Rev. Mr. Pocock said he was gratified at the disposition evinced by the meeting to express, in a substantial form, their appreciation of the valuable services of their officers. He would therefore call attention to another portion of their executive who, they must all consider, were very inadequately remunerated at the present time. He referred to the board of directors. They had shown such zeal, such good judgment, and, he might add, such success, that he thought the time had arrived when they ought to consider whether the sum awarded to them should not be increased. He had it in his mind to propose that the remuneration to the directors should be fixed at £500 per annum; but, as it might be thought that he was going too far, he would propose that it should be put at £400 a year for the future, and that £150 be voted, in addition to the £250, for their services during the past year.

Mr. John Robinson said he should have pleasure in seconding the motion, though he considered the amount ought to be £500 per annum.

Mr. Box moved that the salary of the directors be henceforth £500 per annum.

Mr. Alfred Williams seconded the amendment, which, with the concurrence of Mr. Pocock, was substituted for the original motion, and carried unanimously.

The Chairman, in acknowledging the vote, said that the management of this company up to the present time, by himself and his brother directors, had been a labour of love; and if, instead of increasing their annual salary, they had reduced it, the concern would have been just as well conducted as it was now. They started with the hope of making the Crystal Palace District Gas Company a model one, and he hoped the day was not far distant when it would rank with any similar concern in existence. With regard to the reduction of the price of gas, it was well known that at the present time the public were very desirous of getting a cheap article. He was persuaded that they could not secure a gas of good quality if they persisted in requiring a supply at prices which would not remunerate the manufacturers; and he thought it would be well for the consumers to look more to having perfectly purified gas than to a trifling reduction in the price per 1000 feet. He concluded by moving a vote of thanks to the auditors, which was cordially adopted.

Mr. Pashley acknowledged the vote, and the proceedings closed with the usual compliment to the chairman.

DEPUTATION FROM THE CONSUMERS TO THE CRYSTAL PALACE DISTRICT GAS COMPANY.

On Friday afternoon an interview took place at the Offices of the Crystal Palace District Gas Company, Bell Green, Lower Sydenham, between a committee of the directors, consisting of Mr. Erasmus Wilson, F.R.S. (chairman of the board), Mr. H. P. Stephenson, A.I.C.E. (deputy-chairman), Mr. C. Aird, and Mr. Frederick Hetley, and a deputation from a recent public meeting of consumers, the latter consisting of Mr. J. J. Cockerill (the chairman of the consumers' meeting), of Sydenham Hill; Mr. S. Hodgkinson, of Jews' Walk; Mr. T. A. Rochussen, of Kirkdale; Mr. James Pocklington, Mr. William Moore, Mr. Edward Hunt, and Mr. John Fallwell, the four last-named gentlemen being all of the High Street, Sydenham.

On being introduced to the directors, Mr. Cockerill said the consumers of gas had already expressed their objections to the conduct of the directors, and it was for them, therefore, to listen to any answer that might be made.

The Chairman of the directors said they had received the resolutions passed at the recent meeting, but they found that the supposed facts upon which those resolutions were based did not exist, and they could not, therefore, see any reason for the charges laid against them by the consumers. The directors had no invitation to attend the meeting—probably it was no part of the plan that they should have been—and therefore there was no one present to represent them. The resolutions forwarded to the board set forth that the amount of gas charged to the consumers was excessive. That might have been put "supplied to the consumers." It would almost seem as if the company had charged for that which they had not supplied. Now, they should be able to prove that the supply had not been excessive. Some persons might have had more than others, but they had consumed all that was supplied to them. Again, it was alleged that there had been an undue pressure at the works. Such, however, had not been the case beyond what was necessary to meet the requirements of the district, parts of which were at a considerable distance from the works; and the ground was also hilly, which occasioned, as the deputation would perceive, certain engineering difficulties. The pressure was the same for the private consumers as for the public lamps, which they supplied by contract, and consequently it would be against their own interests to use more pressure than was necessary. The second point was the question of a reduction in the price. That subject had been before the board of directors, but the position of a country or suburban company was not like one in the metropolis, for some of their mains were several miles in length, but supplying only a few meters, while in London

every yard of main was yielding a profit. Their price had been 6s. per 1000 feet, and, after due consideration, the directors resolved to reduce it 6d. per 1000 feet, making the price 5s. 6d., which was the price charged by one of the metropolitan companies close by them. They did not think they could make any further reduction at present. The third resolution sent to them held out a threat of a new company being formed if they did not reduce their price. Now, it would have been fairer if they had been communicated with before such a step was resolved upon. The board were not disposed to take an unfair advantage of the consumers, and were willing to give every explanation in their power, and, therefore, they were not open to the charge of "practising a gross imposition upon the district during the last three months." Such a charge they deemed offensive, and it was one reason why they did not attend the meeting in question. With regard to the purification of the gas and its illuminating power, he wished to make a remark. Its illuminating power was regulated by Act of Parliament, and its purity was subject to the Board of Health, whose officer had from time to time inspected the works, and reported satisfactorily on both points. Their principle from the first had been to supply a good article, and they had reason to believe that they supplied the best gas around London.

Mr. COCKERILL said the pressure had been very great, but he could not explain its cause.

Mr. STEPHENSON (one of the directors) said, with regard to the price of the gas, they could not, with justice to themselves, make any further reduction.

Mr. COCKERILL said, if there had been any want of courtesy in the matter, the members of the deputation deeply regretted it. They had no wish to take extreme measures unless they were compelled, but he thought it right to inform the board that they were in possession of a piece of land for the construction of new works.

Mr. HUNT observed that one chief cause of complaint was that the accounts for the Christmas quarter, 1858, were from one-fourth to one-third larger than in the corresponding quarter of the previous year. Mr. Pocklington would tell them that his account was nearly double what it was in 1857, although he had been economical. He (Mr. Hunt) thought they would find that the charge was universally greater than in the former year, for in canvassing the district they had only met with four exceptions. The public lamps did not manifest any difference of pressure, but in the private lights the pressure varied several times during the evening.

The SECRETARY to the company (Mr. M. Ohren) then read the amount in one account referred to, showing that the gas consumed in 1856 was 50,800 feet; 1857, 44,200 feet; 1858, 45,500 feet; and taking the Christmas quarters of each year the figures were: 1856, 14,400 feet; 1857, 12,700 feet; 1858, 19,500 feet.

Mr. STEPHENSON said on going through the accounts of 1856, 1857, and 1858, the board found that in one part of the district 136 cases were about the average—115 were smaller than previously, and 59 were larger; and in the other part of the district there were 90 average, 91 smaller, and 18 larger.

Mr. HUNT expressed his surprise that such was the result of an examination of the company's books, as it was so very different to what they had been led to expect.

In reply to a question, the CHAIRMAN said the directors had no power to give a greater pressure to the private meters than to the public lights, as they were all supplied by the same mains.

Several members of the deputation expressed themselves as fully satisfied that there was a difference somewhere, and one gentleman said he would not pay his account until he was summoned.

Mr. FALLWELL said the comparison of 1858 with 1856 was unfair, as most tradesmen closed earlier now than in 1856.

The CHAIRMAN said the supply in 1857 was insufficient, and therefore the comparison would not be fair unless they took a previous year.

The question of the pressure was again discussed, and it was stated by the SECRETARY that the pressure at the works was 25-10ths on both the trunk mains—that is, the Sydenham and Norwood supplies—and that the lowest pressure in the district was 10-10ths, which was considered a good working pressure. The working of the exhauster was also explained, together with the contrivance of a governor for that machine, as lately erected by Mr. Ohren.

In the course of further discussion on the question of a reduction,

Mr. STEPHENSON said the Act of Parliameat limited their dividends to £10 per cent.; they only paid £6 per cent., so that it would be seen they could not afford any greater reduction than at present made.

At the conclusion of the interview, which lasted over an hour, the result appeared to be, firstly, that, with regard to the allegation that more gas had been supplied and charged than in the previous year, the directors contended that it was not so, and offered to allow their books to be inspected; secondly with regard to a further reduction in the price, that the board consider they should be acting unjustly to the shareholders if they made any further reduction at present, promising, however, that the matter should have their best attention; and, thirdly, an assurance was given that the pressure was receiving and should continue to receive every attention.

Before the deputation withdrew, the CHAIRMAN of the directors complained that the consumers were not generally the shareholders, as they might be, and it appeared, from a conversation which ensued, that the shares were at a premium in the market.

The deputation then withdrew.

RICHMOND GAS COMPANY.—The Half-Yearly General Meeting of this Company was held at the "Greyhound" Tavern on the 26th ult.—Mr. W. Chapman in the chair—when the following report was submitted:—

The directors have again the pleasing task of congratulating the shareholders upon the continued success and increasing prosperity of the company. The revenue for the past year exhibits an increase of nearly £500 over the previous year, whilst by a diminished expense the net additional profit available to the company is £380. 12s. 9d. They have also the pleasure of stating that every loan to the company has been paid off, the share capital thus remaining the only charge. The directors have also to state that an attempt having been made, by introducing a bill into Parliament, ostensibly for the better management of the parish of Richmond, to injure and possibly to annihilate this company, the directors thought it right to direct such an attempt to be opposed. They are happy to say that the withdrawal of the bill has removed the present danger at but a small charge to the company. The continued prosperity of the company justifies the directors in recommending an increase in the amount of dividend at the rate of 1 per cent. per annum, making 6½ per cent. for the past year; but, whilst benefiting themselves, they think that the time has also arrived for considering the practicability of a reduction in the price of gas to the consumers. Although no legal or moral obligation demands this change, they yet think that a correct commercial principle, as well as the feeling which led to the establishment of this company—viz., a desire to benefit the parish of Richmond—will render the boon no less palatable to the shareholders than beneficial to the consumers; and they hope to make arrangements during the present year for carrying out this object. The balance-sheet, which has been sent to each shareholder, will show the financial state of the company in detail. Four of the directors—viz., Messrs. J. Smith, H. Smith, G. A. Wall, and W. Chapman—go out of office by rotation. They are eligible, and offer themselves for re-election. The auditor, Mr. Pugh, also vacates his seat, and offers himself for re-election.

The above report was adopted unanimously, the retiring directors and auditor re-elected, and the thanks of the meeting presented to W. Chapman, Esq., for his able and courteous conduct in the chair.

GAS AT STANMORE, MIDDLESEX.—On the 3rd inst. the villages of Stanmore, Edgware, and Bushey Heath were for the first time lighted with gas. The works are erected in Stanmore Marsh, about the centre of the district. The plans were prepard and the engineering work carried out by Mr. Alfred Penny, of Wenlock Iron Works, London; and they have been taken on lease by Mr. John Chapman, of the Harrow Gas-Works, who was the original promoter of the undertaking. The event was celebrated by a dinner at the Abercorn Arms, the large room of which was gaily decorated with evergreens, and brilliantly illuminated for the first time with the new light. About 70 of the principal inhabitants sat down to dinner, the chairman of the company, the Rev. F. Burnays, being in the chair, supported by the Rector of Great Stanmore and the Vicar of Edgware. A most agreeable evening was spent, and some well-merited compliments were paid to the promoter, engineer, and builder, for the efficient and expeditious manner in which the works had been erected. They were commenced December 1, 1858, and the whole district was lighted on March 3, 1859.

SOUTH SHIELDS GAS COMPANY.—The Annual General Meeting of this Company was held on the 28th ult. at the offices, Barrington Street, South Shields. R. Wallis, Esq., occupied the chair. The secretary, Mr. Lister, read the directors' report, which stated that the profits in the past year amounted to £1430. 4s. 2d., out of which had been paid the first half year's dividend, in September last. A second dividend, at the same rate—namely, 6½ per cent. per annum—was recommended, leaving a surplus of £130. 4s. 2d. to be carried to the surplus fund account, which then amounted to £407. 4s. 8d. The paid-up capital was £20,000. The report further stated that although a serious depression of trade had prevailed in the town, there had still been an increase in the consumption of gas during the past year. The plant and works were in excellent working order. The supply of gas had been so well maintained during the dark winter months, the directors did not see a necessity of increasing the works this year, further than laying a few new mains in the new streets which had been completed in various parts of the town. The Chairman drew the attention of the shareholders to the difficulty of getting rid of the ammomial liquor from the gas-works, and said that the directors had had under their serious consideration the desirability of converting it into artificial manure, which, it was thought, would yield a considerable revenue to the company. When the plan was thoroughly matured it would be laid before the shareholders.—Mr. Maxwell seconded the adoption of the report, which was unanimously carried.—Mr. Anderson moved that the dividend be at the rate of 6½ per cent. per annum, payable on the 4th of March; seconded by Mr. Hall, and carried.—Mr. Charles Anderson, of the Deans, proposed a vote of thanks to the directors and auditors for their services during the past year; seconded by Mr. Armstrong, and carried.—The Chairman returned thanks on behalf of his brother directors, and Mr. Potts, on behalf of Mr. Hardy and himself as auditors.—Mr. Potts paid a well-merited compliment to the company's secretary, Mr. Lister, for the efficient manner in which the books are kept.—Mr Potts here asked the chairman whether the manufacture of sulphate of ammonia would cause any nuisance to the inhabitants near the gas-works.—The Chairman, in reply, assured the meeting that the necessary apparatus completely provides against any nuisance whatever. He gave it as his opinion that by the aid of chemistry, gas-works could be made still more profitable to shareholders.—Mr. Maxwell proposed a vote of thanks to the chairman for presiding at the meeting, which was carried and acknowledged.

A ROLAND FOR AN OLIVER.—The following are copies of a note addressed to the Richmond Gas Company by P. R. Welch, Esq., barrister-at-law, and the pungent reply thereto by Mr. Spice, the company's engineer and manager:—

22/1/59.

Gentlemen,—I've gone on hoping against hope, that the gas you supply at a very high price would have improved from month to month, but uselessly, for when it is not worse than ordinary, it never excels that bad standard.

I've often been obliged to light lamps and candles in the same room with and at the same time the gas supplied by you is struggling to light the place.

I cannot believe the amount of gas you charge me for is consumed—besides, the smell is very bad.

There must be some alteration, else I must discontinue the gas, till of a better quality.

For some few years, I've often complained in a similar manner.

And am your humble servant,
P. R. WELCH.

To the Richmond Gas Company, Richmond.

The Green, Feb. 9, 1859.

Sir,—The note which you addressed on the 22nd ult., "To the Richmond Gas Company," was read at a meeting of the directors of that company on the 31st ult., and referred to me.

I am sorry that my continued absence from home has prevented my taking notice of it till now,—and now what can I say to your "hoping against hope?" why, only that I have no doubt it is so. You begin, I suppose, to see that your "Bill" will never become an "Act of Parliament," and that there is therefore great danger of its being financially "*no go!*" and so you go on "hoping against hope," and, to help it on, you want a case against the gas company, but I am afraid your own experience will not help you. Let us see what it is.

First, you get a gas cooking stove, which happened to be so contrived and fitted that the gas could not get to the burners, and, as a further impediment, you have a gas-regulator to check the supply; and while this state of things continued you were often obliged to take your meat out of the stove and finish cooking it before a common fire. Concerning this, you make complaints to "the gas company," and in reply, you are told the fault is in the fittings in and about your stove; but as you know everything better than anybody else knows anything, you "know better," and go on complaining to "the gas company" and spoiling your meat, until, in about twelve months, you consent to some alterations being made in your own fittings, the result of which was, that you got plenty of gas for cooking, and your cook was satisfied; but I suppose you were not, or if you were, you had not the courtesy to write to "the gas company" to admit that which you must know was the plain truth, viz., that all the time you were complaining of an insufficient supply, the supply was ample, but that the flow of gas to your burners had been impeded by faults in your own fittings, and the intervention of a contrivance designed expressly to impede it, and so economize the consumption.

A few months elapse, and then what? Why, your manifesto of the 22nd ultimo, respecting, first, high price of gas; secondly, expected monthly improvements; thirdly, inferior quality; fourthly, the *struggling* character of the gas; fifthly, unbelief in quantity consumed; and, sixthly, the smell is bad. And now let us examine these six points. As to

The first,—I suppose you are aware that the price is the same in the surrounding parishes, except in one, in which it is 6d. per 1000 feet less, and I may tell you that it is the desire of the directors of the Richmond Gas Company to make a reduction to this amount as soon as they can—not, however, on account of complaints, but from a feeling which has always influenced and guided them; in proof of which I refer to the fact that they were the *first* to supply gas at so low a price as 6s. per 1000 feet in this district, at a time when it was 6s. in the City of London, and 7s., 8s., and 10s. in this neighbourhood. And as to

The second,—The idea is quite new, and excites a smile. I have heard of monthly nurses, but never till now have I heard of monthly improvements in the quality of gas. I assure you, if improvement were needed, I would not wait a day before effecting it, much less a month. And now for

The third, or bad quality clause,—I must express my surprise that you, a member of a learned profession, should write so that you cannot be understood, and can only attribute it to your not understanding what you are writing about. You say, "I

have gone on hoping against hope, that the gas you supply at a very high price would improve from month to month, but uselessly, for when it is not worse than ordinary, it never excels that bad standard." What standard? The high-price standard? the month-to-month standard? or the ordinary standard? All the English, or rather Irish, which I can extract from this is, that when it is not worse it is not better! Really, you must be a genius! But let me in all candour tell you that I shall be able to prove, and may have to prove to a committee of the House of Commons, that the ordinary standard, as you call it, of the gas supplied in Richmond is about 13 candles. Now we come to

The fourth, or struggling gas clause,—This is another new idea; struggling gas! very curious. I have often heard of a person struggling to obtain knowledge under difficulties, and really your notes on this subject induce the belief that your struggles in the pursuit of knowledge were scarcely sufficient, or that the difficulties in your way were too great, so that you were obliged to be content with a small stock. Struggling gas! Well, we will say no more about it beyond this, that when, in consequence of your note of the 22nd ult., an inspector went and took off *your bad burners*, and put on good ones, and lighted the gas, Mrs. Welch at once admitted that it was "beautiful;" and thus it was established that if the gas really did, as you say, struggle, it was against your own impediments—bad burners. And now having left off "struggling," we come to

The fifth, or unbelieving cause,—I cannot express, because I do not feel, any surprise at your unbelief in anything connected with gas as supplied by *a company*. I apprehend you would not believe in any gas not supplied by *commissioners;* but as commissioners are not likely to be appointed, and if appointed, would most assuredly not be allowed by Parliament to *deal in gas*, I will endeavour to help you to a true faith in regard to the measurement of your gas by allowing you to use your own measure, if you will buy a meter of any respectable maker and send it to the Richmond Gas-Works to be proved; I will allow your fitter to fix it, and will have the gas company's meter removed from your premises. And now for

The sixth and last, or bad-smelling clause,—No doubt it does smell, and as gas is an invisible agent, it is as well that it does *smell*, so that when it escapes, by accident or through imperfect fittings, its presence may be discovered.

And now, in conclusion, let me just tell you, that although I have only called the last "the bad-smelling clause," I smell something in every clause of your note; Yes, "I smell a rat," a political rat; and all I say is, *it won't do*. The Richmond Gas Company have 750 customers, and you are the only unhappy one. The company's greatest satisfaction is in satisfying *all* their consumers; this they endeavour to do by every means in their power, and few companies have succeeded better.

I am, Sir, your obedient servant,

E. P. SPICE.

Advertisements.

NOW READY,

VOL. VII. of the JOURNAL of GAS LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1858, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., IV., V. and VI. are still on sale.

W. B. KING, 11, Bolt Court, Fleet Street.

THE GREAT CENTRAL GAS CONSUMERS' COMPANY.

Just Published,

A FULL Report of the Proceedings on the ARBITRATION between A. A. CROLL, Esq., and the GREAT CENTRAL GAS CONSUMERS' COMPANY. Before C. MAY, Esq., C.E., F.R.S., and THOMAS G. BARLOW, Esq., C.E., Arbitrators, and C. HOGGINS, Esq., Q.C., Umpire.

Reprinted from the *Journal of Gas Lighting, Water Supply, and Sanitary Improvement.*

Price 5s., bound in cloth.

A few Copies are on Sale, bound up with the Proceedings before the Parliamentary Committee on the Company's Bill in 1850—price 7s. 6d.

W. B. KING, Office of the "JOURNAL OF GAS LIGHTING," &c., 11, Bolt Court, Fleet Street, LONDON, E.C.

WEST and GREGSON, Gas-Meter MANUFACTURERS, &c.

UNION STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

BRYAN DONKIN and CO.'s improved GAS VALVES have been adopted by numerous Gas Companies in England and abroad, and their advantages and great security fully proved. Very large numbers are in use. Prices from 11s. 6d. to 13s. 6d. per inch diameter.

BRYAN DONKIN and Co., Engineers, near Grange Road, BERMONDSEY.

WILLIAM RYDER, General MINERAL AND METAL AGENT AND MERCHANT, 4, DEAN STREET, NEWCASTLE-ON-TYNE,

is prepared to supply Gas and Water Companies with Apparatus and Appliances of every description, including Cast and Wrought Iron Goods, Coals, Fire-Bricks, Retorts, &c. &c.

Any communications addressed to him as above shall have prompt attention.

M. SHEEN, Gas and Railway Lantern Maker, 90½, Holborn Hill, begs to inform Managers of Gas-Works, &c., that she continues to contract and supply Lanterns on reasonable terms, and keep them in repair by the year.

ADDISON POTTER, WILLINGTON QUAY, NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

ROBERT MACLAREN and CO., EGLINTON FOUNDRY, GLASGOW,

Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

WALTER MABON, Engineer, ARDWICK IRON WORKS, FAIRFIELD STREET, MANCHESTER,

Manufacturer of

IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

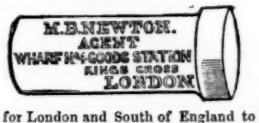
PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

By Royal Letters Patent.

KAY'S Patent Equitable Gas-Meter is the most effective preventive of fraud by "tilting," and is as simple in construction as the common meter.

Manufactured only by W. COWAN, 60, BUCCLEUCH STREET, EDINBURGH.

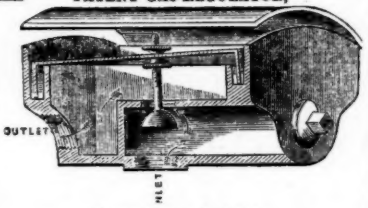
J. CLIFF'S Fire Bricks, Clay RETORTS, &c.



Orders for London and South of England to be addressed to Mr. NEWTON, Agent for the District, 16, Castle Terrace, New Hampstead Road, KENTISH TOWN, N.W.

N.B.—A few Retorts of each size, and a large stock of Bricks and Lumps, always on hand at the above Wharf.

ESPLIN'S, commonly called Judkin's PATENT GAS-REGULATOR,



Is manufactured solely by THOMAS LAMBERT and SON, Short Street, New Cut, Lambeth, LONDON,

And is by them supplied wholesale at the following prices:—

¼-in. for 5 lights, 15s. 6d. ¾-in. for 10 lights, 25s. 6d. 1-in. for 20 lights, 34s. 6d. 1¼-in. for 30 lights, 48s. 1½-in. for 60 lights, 65s. 2-in. for 100 to 150 lights, 93s. each.

A saving in the consumption of Gas of from 20 to 25 per cent. is effected by the use of this Regulator.

A liberal discount allowed to the Trade.

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DIRECT-ACTING GAS-EXHAUSTERS,

supplied either with or without Steam-Engines and Boilers.

FOUR-WAY DIAPHRAGM VALVES,

one of which answers the purpose of THREE ordinary Valves, as applied to Purifiers, or in shutting off and passing Station-Meters, Governors, or other apparatus, while the Connecting-Pipes are also much simplified.

RETORT SETTINGS,

designed to be heated by Tar alone, and with a total absence of Smoke.

Illustrated circulars, giving references and every information, may be obtained on application as above.

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MR. LAMING (Inventor of the Revivified Oxide of Iron Purification) has the satisfaction to announce that Gas may now be purified in a manner that combines unusual commercial advantages with all the possible requirements of the sanitary officer and the public. All that need be said to call attention to the new process is, that instead of the purifying-house, two vessels of small area, placed after the condenser, suffice; that these vessels never have the least communication with the atmosphere; and that neither lime, oxide, nor any other substance foreign to the gas itself is brought into contact with it. Gas engineers will perceive among the advantages thus offered, economy in room, labour, and materials; impossibility of nuisance; and total absence of injury to the illuminating power.

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PADDON and FORD respectfully invite the attention of Gas Companies and Managers to their PATENT STREET LAMP REGULATOR, which ensures any required consumption.

By its use a great saving is effected, and the item of "Unaccounted-for Gas" considerably decreased.

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Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, LANTERNS, &c. &c.

Contractors for the erection or alteration of Gas-Works; and every description of Apparatus required in Gas-Works supplied.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,

GLOBE PATENT TUBE WORKS, WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

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Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS, TO MODEL OR DRAWING.

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References given, if required.

TO THE GAS COMPANIES OF GREAT BRITAIN AND THE CONTINENT.

CANNEL AND COAL FOR GAS PURPOSES.—Fifteen years' connexion with one of the largest Gas Concerns in England, enables us from practical experience to certify that the CANNEL and COAL we offer are those best suited for Gas purposes.

On application, we shall have much pleasure in forwarding our Tabulated Statements of Analyses, with Prices and Terms; also References as to respectability.

All Contract Orders have our careful and best attention.

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VULCANIZED INDIARUBBER AIR-TIGHT BAGS, any size, for Gas Mains, with flexible tubes attached, and fitted with stop-cocks complete.

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Originally established in 1833,

Manufacturer of Gas and other Tubes, Fittings, and articles of every description belonging to Gas, Water, or Steam.

E. D. had the honour of receiving the

PRIZE MEDAL

awarded to this Manufacture by the COUNCIL of the GREAT ENGLISH EXHIBITION of 1851; and from the latter date has supplied many towns exclusively with GALVANIZED and other Tubes for Gas and Water, under GOVERNMENT ENGINEERS.

A City, containing 150,000 inhabitants, has recently been entirely supplied with Tubes made at the above-named Works, and several others with populations nearly as great; in fact, the reputation now acquired induces this notice to the public.

Large Stocks generally on hand, averaging from one to three hundred thousand feet.

HYDRAULIC PRESS TUBES, to resist 6000 lbs. and upwards to the square inch, extensively manufactured.

STOCK DIES and SCREWING TACKLE, of the best possible description.

Every Tube carefully tested with Hydraulic Pressure before leaving the Works.

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(SUCCESSORS TO THE LATE SAMUEL CROSLEY,)

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Beg to announce that, in addition to the Manufacture of

GAS-METERS,

they continue the Manufacture of

METERS FOR MEASURING WATER, SPIRITS, &c.,

commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

By Her Majesty's Royal Letters Patent.

JAMES MEACOCK,

PATENT DRY and IMPROVED WET GAS-METER WORKS,

7, SNOW HILL, AND 16, WEST STREET, LONDON.

ESTABLISHED 1836.

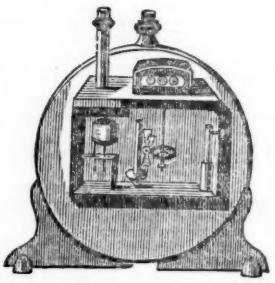
J. MEACOCK begs to call attention to his patent method of securing the Leather diaphragm of his Dry Meter. Instead of using the soldering iron for this purpose, it is held between two flat Metal Rings, and screwed up sound to a metal frame, as shown in the drawing.

By this improvement the perishing effect of hot tools to leather being avoided, its durability must be longer; also, its repair when needful is most simple, as a new leather diaphragm can be applied by merely unscrewing the old one from the rim or frame to which it had been screwed up.

Meters of Gas Companies being subject to so much wear and tear, J. M. begs leave to assure those who may honour him with their commands, that nothing but the stoutest materials for cases, the hardest gas-resisting metals, and best foreign leather for the interiors, will be used, and none but first-class workmen employed in their construction.

Wet Gas-Meters Repaired and Reconstructed with J. Meacock's Modern Improvements.

METERS SENT ON APPROVAL.



In consequence of the great demand for the above Meters, J. Meacock has found it necessary to remove his Manufactory to more extensive Premises, 16, West Street, Smithfield, where Orders will be executed on the shortest notice.

EDWARD COCKEY & SONS'

PATENT GAS VALVES.

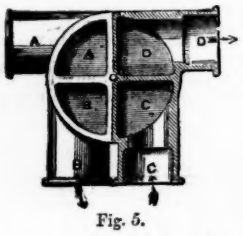


Fig. 5.

THESE Valves are formed of two cast-iron cylinders, with segmental divisions, having faces ground gas-tight, the upper cylinder turning horizontally on the lower one.

The lower cylinder has pipes from each division communicating with the vessels to and from which gas is to be passed. The upper cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one to alter the flow of gas from one vessel to another.

Fig. 6.

Fig. 5 represents the Valve arranged for a bye-pass, in which, by turning the upper cylinder, Fig. 6, the Gas is directed either through the bye-pass, or through the vessel to which it is attached.

Another arrangement is just completed for two purifiers, by which the Gas may be directed through both purifiers together, entering either first, or through either purifier separately. The advantages of this arrangement will be too manifest to Gas Manufacturers to need comment.

The Valves are manufactured by the Patentees at their

IRON WORKS, FROME SELWOOD.

The following Testimonial has been received from an eminent Engineer:—

Gaslight and Coke Company's Office, Cheltenham, Jan. 17, 1859.

Messrs. Cockey and Sons, Frome.

Gentlemen,—The Patent Purifier Centre Valve which I had fixed instead of the common hydraulic valve for one of our sets of purifiers with 9-inch connexions, I am happy to say continues to afford satisfaction both to myself and to the workmen who have the charge of it.

I am, Gentlemen, yours truly, W. ESSON.

EDWARD COCKEY AND SONS

ALSO MANUFACTURE

PURIFIERS, SCRUBBERS, CONDENSERS, AND OTHER IMPROVED GAS APPARATUS,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

FIRE-CLAY GAS RETORTS.

ESTABLISHED IN 1795.

JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS, near LEEDS.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of { LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY OF THE SAME QUALITY.

M. B. NEWTON, London Agent, No. 4, Wharf, King's Cross Goods Station.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

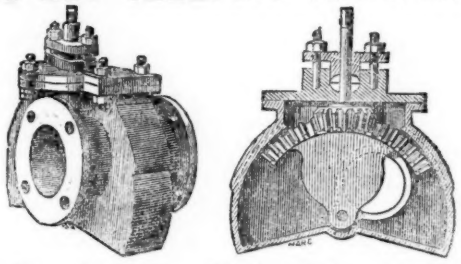
HARRIS and PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE BRICKS GAS RETORTS &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.
Late in the occupation of I. and W. King.
Originally J. Pidcock, Esq.

GEORGE CUTLER, Gasholder MAKER,

No. 8, WENLOCK-ROAD, CITY-ROAD, LONDON.

Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

BEST AND CHEAPEST SLUICE-COCK.



BROWN AND MAY'S PATENT.

Above 3-inch diameter, price 10s. per inch. Brass face, 6d. per inch extra.

Can be taken to pieces without being removed from the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C., Where a Sample may be seen.

"ALL DOUBTS REMOVED."

DEFRIES' celebrated Dry Gas-METERS, of which there are 80,000 in use in Palaces, Churches, Chapels, Royal Dock-yards, Club Houses, Public Offices, and other buildings throughout the Empire, the Continent, and Colonies.

His meter for 1500 lights, in use upwards of ten years at the Royal Italian Opera, until that building was destroyed by fire, was long afterwards dug out of the burnt ruins, then tested by the Chartered Gas Company and found inflexibly correct.

On the 9th of June, 1858, at the Western Gas Company, his meter for 150 lights, after considerable use, was doubted, and subjected to the most variable tests, from the full lighting down to a single jet, and in each case, as in numerous other instances, accuracy was finely indicated.

His two large meters at the Thames Tunnel have been in constant use day and night for upwards of twelve years (one continuation of dark hours), subjected to the wear and tear of 75 years, as compared with the ordinary hours of using gaslight above ground.

Gas Companies honouring Mr. Defries with their commands for his PATENT DRY METER, which has done so much service in simplifying the fitting up of gas, as well as checking surreptitious burning, will be guaranteed perfection for five years free of charge.

Defries' Prize-Medal Gas Baths, Gas-Cooking and Heating Stoves. The Polytechnic Gas Fire, with indestructible fuel, in daily operation (Saturday excepted) at the Office, 406, Euston Road, Fitzroy Square, LONDON.

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

London Agents: CHADWICK and AKEROYD, Willington Stone Wharf, Regent's Park Basin.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

ALEXANDER WRIGHT,

GAS ENGINEER, MANUFACTURER OF GAS-METERS, GOVERNORS, AND EVERY DESCRIPTION OF GAS APPARATUS,
55, MILLBANK STREET, WESTMINSTER.
CONSUMERS' METERS at the List Price, with a Liberal Discount to Wholesale Purchasers.
THOMPSON'S BROMINE TEST, £1. 1s.—BROMINE, 3s. per Ounce.
BISULPHURET OF CARBON TEST, £2. 2s.
APPARATUS FOR DETERMINING THE HEATING POWER OF SAMPLES OF COAL AND OTHER DESCRIPTIONS OF FUEL, £5. 5s.,
INVENTED BY LEWIS THOMPSON, Esq., M.R.C.S.
REGISTERING PRESSURE GAUGE, Net Price, £8. Glass Shade, 10s. extra.
STATION METERS, PRESSURE GAUGES, PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, &c.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.
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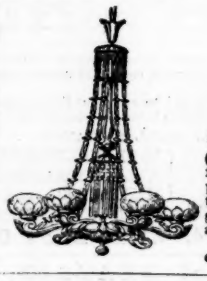

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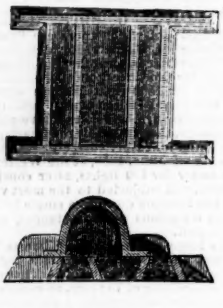
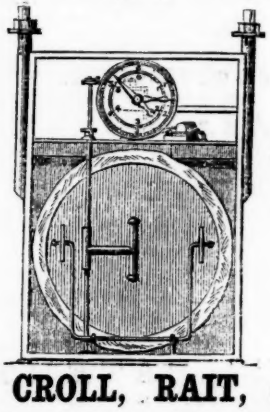
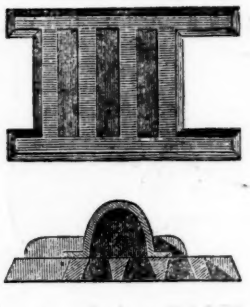




OLD VALVE.



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